

STEREO INTEGRATED AMPLIFIER/TUNER

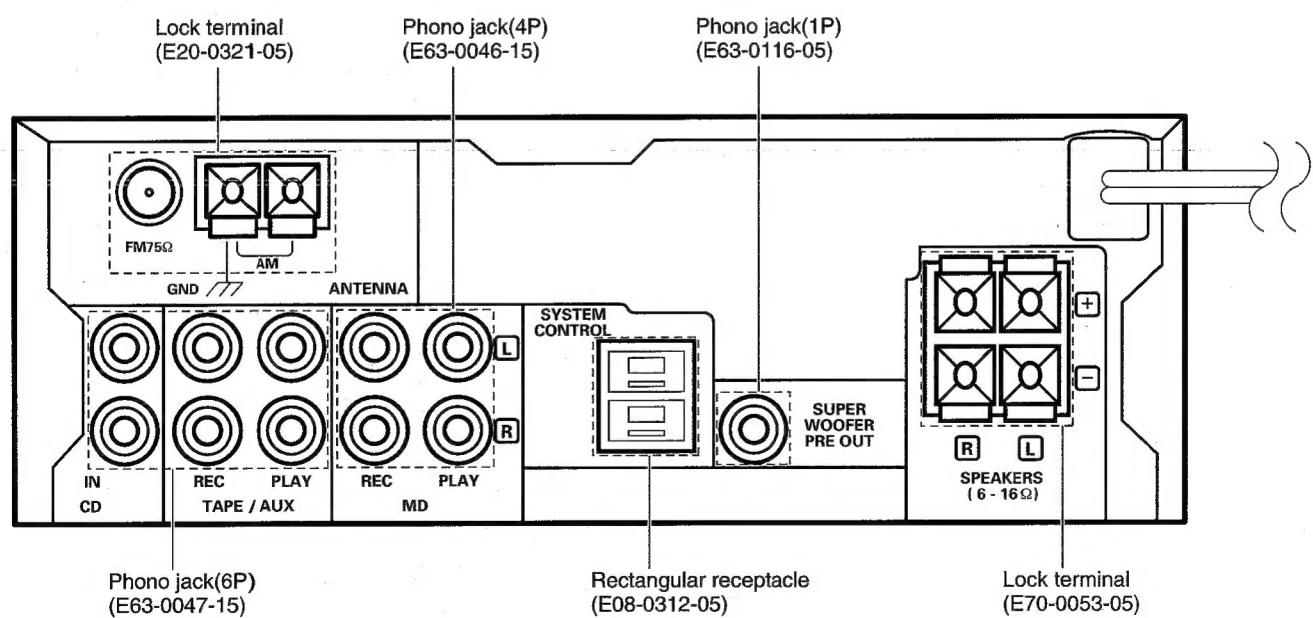
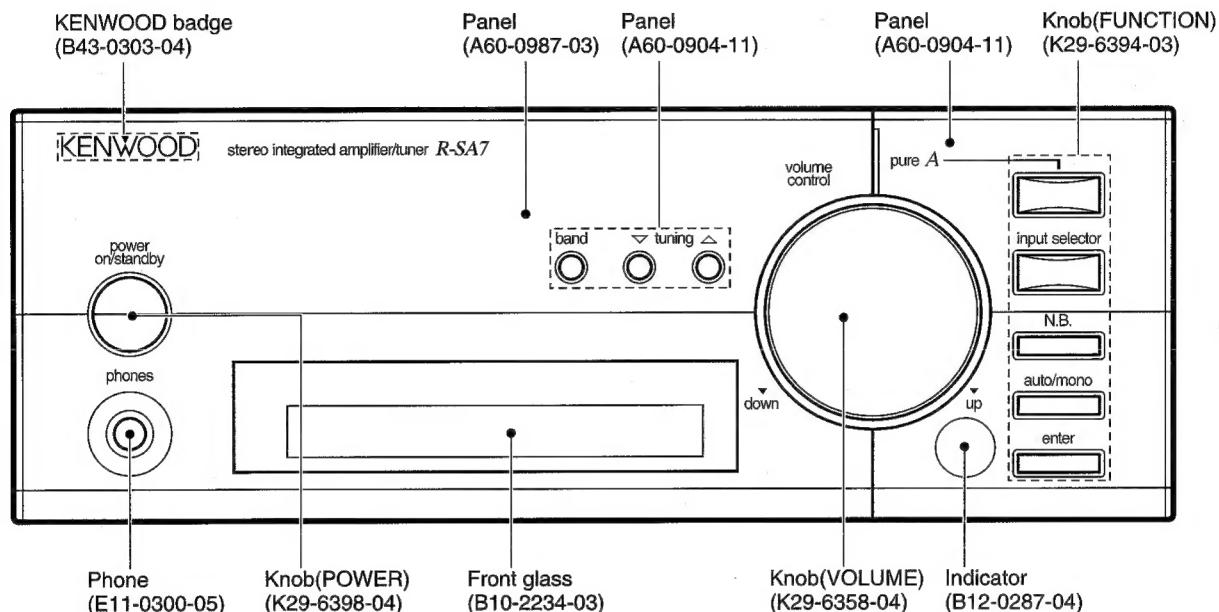
**R-SA7**

**SERVICE MANUAL**

**(HM-7)**

**KENWOOD**

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Caution : No connection of ground line if disassemble the unit.

Please connection the ground line on rear panel, PCBs, Chassis and some others.

# R-SA7

## CONTENTS / ACCESSORIES

### Contents

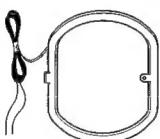
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### Accessories

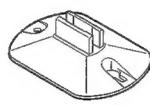
FM indoor antenna .....(1)  
(T90-0809-05)



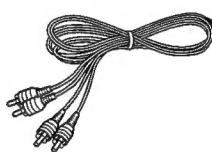
AM loop antenna .....(1)  
(T90-0820-05)



Loop antenna stand (1)  
(J19-3645-05)

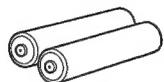


Audio cord .....(1)  
(E30-0615-05)

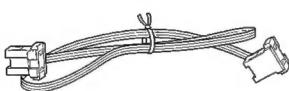


Batteries (R6/AA) .....(2)

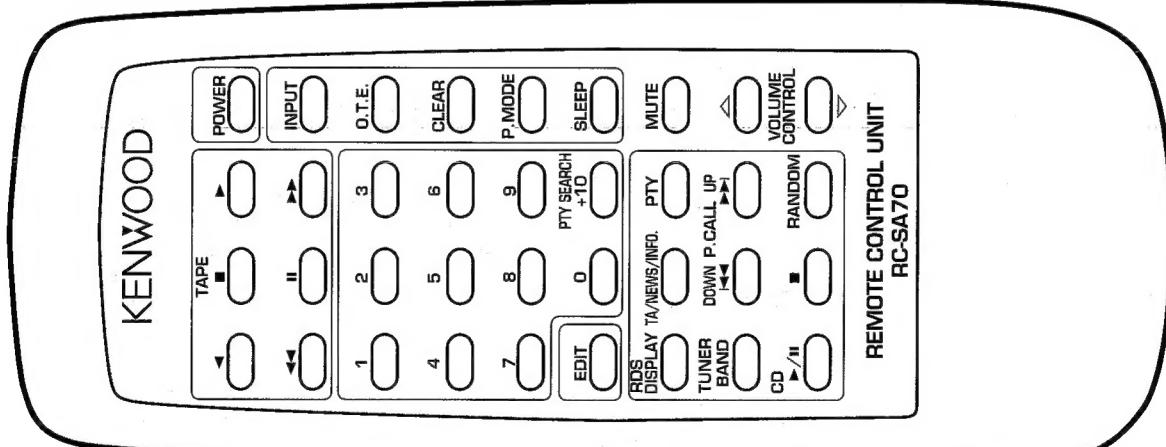
(—)



System control cord .....(1)  
(E30-2628-05)



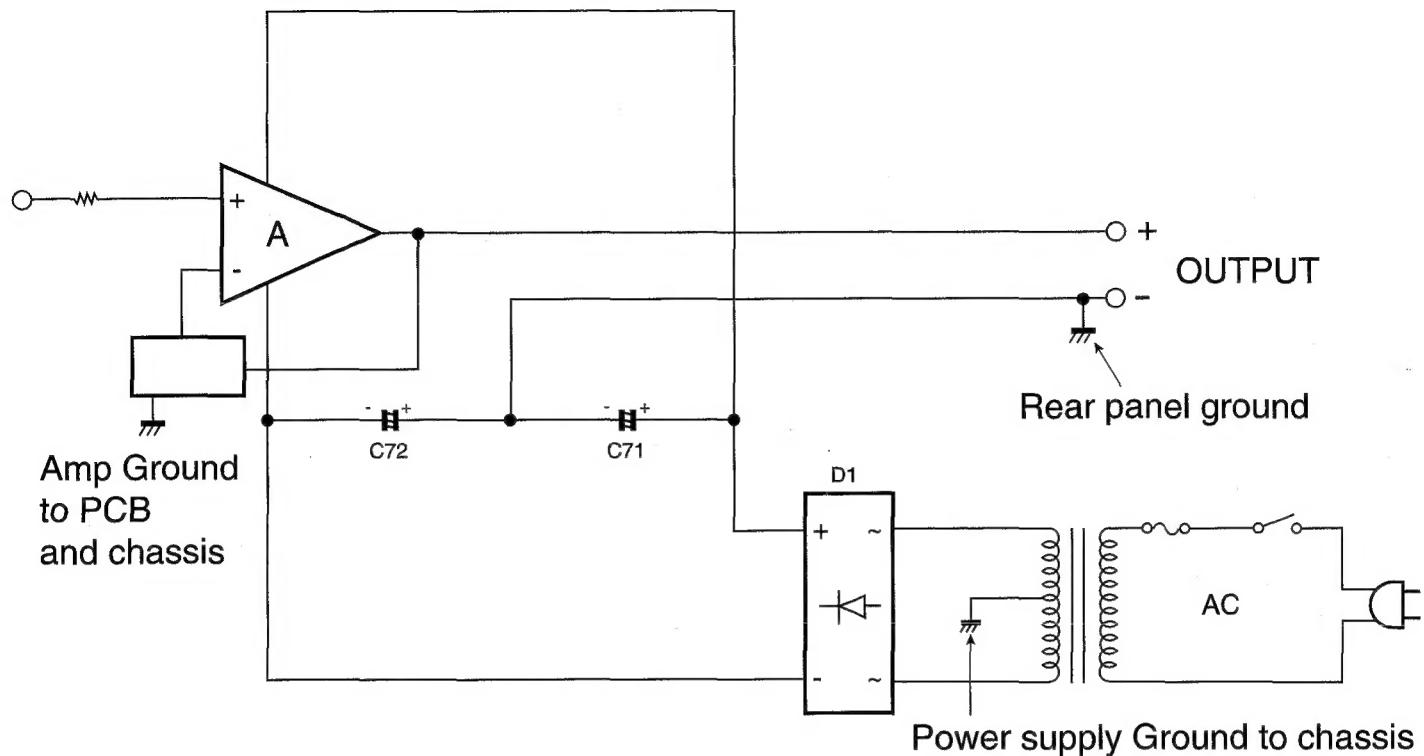
Remote control unit .....(1)  
(A70-1086-05)



### System configuration

SYSTEM NAME	RECEIVER	CD PLAYER	CASSETTE DECK
HM-7	R-SA7	DP-SA7	X-SA7

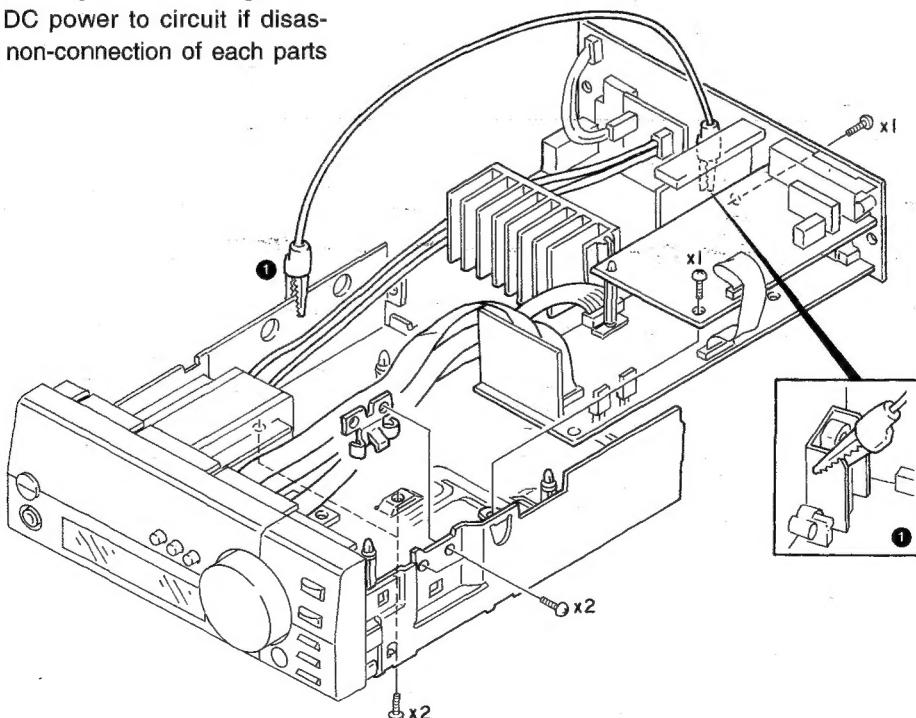
## CAUTION FOR REPAIR



## DISASSEMBLY FOR REPAIR

Caution : R-SA7's circuit design use chassis ground.

Not supply DC power to circuit if disassembly and non-connection of each parts on R-SA7.



Connect the alligator clip with wire between main chassis and the ground of system control. (1)

## CIRCUIT DESCRIPTION

## 1. INITIAL STATE

## (1) AMP-related block

• POWER	OFF
• SELECTOR SOURCE	TUNER
• DISPLAY	SELECTOR
• N.B. CIRCUIT	OFF
• A CLASS VOLUME VALUE	1.40 STEP
• AB CLASS VOLUME VALUE	7 STEP
• PURE MODE	NORMAL (AB CLASS)
• AUTO POWER SAVE	OFF

## (2) TUNER-related block

• BAND	FM
• FREQUENCY	Lower-limit value of receiving frequency. 87.5 MHz
FM	531 kHz
AM	
• AUTO/MANUAL	AUTO
• P.CH MEMORY	Last frequency
• Last P.CH	01ch
• RDS DATA TABLE MEMORY	NO DATA

## (3) TIMER-rated block

• CLOCK	STOP (AM12:00)
• PROGRAM	WORKING MODE OFF
CONTENTS OF PROGR.	ON=AM 12:00
	OFF=AM 12:00
	PLAY MODE=PLAY
	SELECTOR=TUNER(1ch)
	REC MODE OFF
• OTT	WORKING MODE OFF
OTT ON TIME	AM 7:00

## (4) TEST PRESET FREQUENCY

Channel	BAND	E TYPE	Channel	BAND	E TYPE
01ch	FM	87.50MHz	11ch	FM	90.00MHz
02ch	FM	97.50MHz	12ch	FM	98.00MHz
03ch	FM	108.00MHz	13ch	FM	98.50MHz
04ch	AM	630kHz	14ch	FM	106.00MHz
05ch	AM	999kHz	15ch	AM	531kHz
06ch	AM	1440kHz	16ch	AM	990kHz
07ch	FM	87.50MHz	17ch	AM	1602kHz
08ch	FM	87.50MHz	18ch	FM	87.50MHz
09ch	FM	87.50MHz	19ch	FM	87.50MHz
10ch	FM	89.10MHz	20ch	FM	87.50MHz

※ The initial setting is performed in a following event :

1. When backup memory data is destroyed when reset is applied to the microprocessor.
2. When the power cord is plugged in to the AC wall outlet while pressing the POWER key.

## 2. BACKUP

This function holds the current state of the unit even if the AC power of the receiver is turned OFF.

## (1) Operation outline

The backup state set command signal (CE) of a microcomputer is set low when the AC power is turned OFF. The microcomputer detects the signal and enters the stop state. The microcomputer is reset when the AC power is turned ON. The data for backup state confirmation is checked by reset processing.

The microcomputer is initialized when the data was destroyed. If it is not destroyed, the microcomputer is started in the backup state.

- The data for backup state confirmation is written in a RAM area.
- The microcomputer is set to the STOP mode so as to save the power consumption.
- A backup state set command signal is detected by a timer interrupt of 1 msec.
- The backup guarantee period is set in a circuit.

## (2) Backup state setting

- The data (5A69H) for backup state confirmation is written in a RAM area.

## (3) Contents of backup data to be held

## --- AMP ---

- POWER ON/OFF
- DISPLAY MODE
- SELECTOR SOURCE
- N.B. CIRCUIT MODE
- A CLASS VOLUME VALUE
- AB CLASS VOLUME VALUE
- PURE A MODE

## --- TUNER ---

- LAST BAND
- PRESET CHANNEL/RECEIVING STATION FREQUENCY/PI/TA/PTY/PS
- LAST RECEIVING STATION FREQUENCY AND PRESET CHANNEL (AM/FM)
- PRESET MEMORY data (1ch~40ch)
- AUTO/MANUAL

## --- CLOCK/TIMER ---

- LAST CLOCK DATA
- PROGRAMMED CONTENTS/PROGRAM TIMER WORKING MODE ON/OFF
- O.T.T. SETTING TIME/O.T.T. WORKING MODE ON/OFF

## CIRCUIT DESCRIPTION

### 3. DESTINATION LIST OF TUNER

Table 3-1 Destination List of Tuner

Desti- nation	BAND	Receive frequency range	channel space	IF	PLL reference frequency	DIODE SW0 (D518)
E3 (RDS)	FM	87.5MHz ~108.0MHz	50kHz	+10.7MHz	25kHz	1
	AM	531kHz ~1602kHz	9kHz	+450kHz	9kHz	

**DIODE SW(DSWX) : 1 = With DIODE**  
(When static, input HIGH)

#### ※ ATTENTION

The RDS PTY AF search always corresponds to a span search of 100kHz. Therefore, a span search of 50 kHz cannot be performed.

### 4. TEST MODE

#### 4-1. Initializing

The system is initialized when the power is turned on while pressing the POWER key.

(1) Contents of operation

- All the functions are initialized.

#### 4-2. AMP test mode using main unit's keys

4-2-1. Entering the AMP test mode

- Turn on the power while pressing the TUNING DOWN key.

4-2-2. Canceling the AMP test mode

- By turning off the power, the system is initialized and the test mode is canceled.

4-2-3. Contents of AMP test mode

(1) Automatic POWER ON

- The POWER ON state is entered whenever the power is turned on while pressing the TUNING DOWN key. All functions are then initialized and activated in the all-lighting mode.
- Sub-clock oscillation diagnosis function

The oscillation diagnosis (existence of oscillation and measurement of period) of a sub-clock is performed before the test mode is entered. If the diagnosis result is OK, the system enters the test mode.

If the diagnosis result is NG, the oscillation of the sub-clock is diagnosed again. If the result is OK, the system enters the test mode. If the diagnosis result is continuously NG five times, the system stops with ERR 1 and ERR 2 displayed.

(2) All-lighting mode

- All the fluorescent display indicators and LED lamps light when the power is turned on while pressing the TUNING DOWN key.

- After that, the all-lighting mode is canceled when any main unit's key is pressed. The normal display obtained when the selector is set to TUNER then appears.

(3) Others

- The AMP test mode is not terminated even if the selector is set to positions other than TUNER.
- In the AMP test mode, the muting during mode selection is not controlled. However, the operation during the power-on sequence is the same as the normal operation.
- The SP protection operation is also the same as the normal operation.
- In the AMP test mode using main unit's keys, the keys below provide a special operation according to the position where the selector is set. The main unit's keys except described below and the rotary encoder provide the normal operation.

(4) When selector is set to TUNER

Key	Operation
CLASS A key	Increments the P.CALL every time this key is pressed.
N.B. key	Decrement the P.CALL every time this key is pressed.
ENTER key	Selects the display cyclically in the order below every time this key is pressed.

① Write data in the unused area of EEPROM, then read the written data. If the read data is the same as the written data, "RAM OK" is displayed in the fluorescent display indicator. If the former is different from the latter, "RAM NG" is displayed.

② Set the TUNER ATT to OFF and display the S level in hexadecimal when the ENTER key is pressed. ("ATT OFF \*\*" is displayed in the fluorescent display indicator.)

③ Set the TUNER ATT to ON and display the S level in hexadecimal when the ENTER key is pressed. ("ATT ON \*\*" is displayed in the fluorescent display indicator.)

\* The special display using the ENTER key is continued until the next operation is carried out. (\*\*: S LEVEL)

When keys other than ENTER are pressed in items ① to ③ above, the TUNER ATT is set to OFF and the normal display appears. The operation corresponding to the key that has been pressed is performed in this case.

(5) When selector is set to positions other than TUNER

[ ENTER key ] Sets the master volume to the middle value (NORMAL 18 and LOW POWER 3.60) every time this key is pressed.

\* The normal operation is performed when the ENTER key is continuously pressed for two seconds (nothing is done).

[ TUNING UP key ] Sets the master volume to the maximum value (NORMAL 70 and LOW POWER 12.00) every time this key is pressed.

[ TUNING DOWN key ] Sets the master volume to the minimum value (NORMAL 1 and LOW POWER 0.20) every time this key is pressed.

## CIRCUIT DESCRIPTION

[ AUTO key ] Selects the MUTE operation and equalizer cyclically in the order below for operation display every time this key is pressed.

--> MUTE operation -> Minimum -> Maximum -> Flat --

\* In the operation for except the AUTO key, the equalizer is made flat.

[ BAND key ] Every time this key is pressed, all the displays go off and the normal display is selected cyclically.

#### 4-3. RDS test mode using main unit's keys

##### 4-3-1. Entering the RDS test mode

- Turn on the power while pressing the TUNING UP key.

##### 4-3-2. Canceling the RDS test mode

- By turning off the power, the system is initialized and the test mode is canceled.

##### 4-3-3. Contents of RDS test mode

- The POWER ON state is entered whenever the power is turned on while pressing the TUNING UP key. All the functions are then initialized.
- In the RDS test mode using main unit's keys, the keys below provides a special operation according to the position where the selector is set. The main unit's keys except described below and the rotary encoder provide the normal operation.

Key	Operation
CLASS A key	Performs the same operation as for remote control key "DISPLAY" every time this key is pressed.
INPUT SEL. key	Performs the same operation as for remote control key "PTY" every time this key is pressed.
N.B. key	Performs the same operation as for remote control key "TA" every time this key is pressed.
ENTER key	Selects the display cyclically in the order below every time this key is pressed.

① Write data in the unused area of EEPROM, then read the written data. If the read data is the same as the written data, "RAM OK" is displayed in the fluorescent display indicator. If the former is different from the latter, "RAM NG" is displayed.

② Set the TUNER ATT to OFF and display the S level in hexadecimal when the ENTER key is pressed. ("ATT OFF \*\*" is displayed in the fluorescent display indicator.)

③ Set the TUNER ATT to ON and display the S level in hexadecimal when the ENTER key is pressed. ("ATT ON \*\*" is displayed in the fluorescent display indicator.)

\* The special display using the ENTER key is continued until the next operation is carried out. (\*\*: S LEVEL)

When keys other than ENTER are pressed in items ① to ③ above, the TUNER ATT is set to OFF and the normal display appears. The operation corresponding to the key that has been pressed is performed in this case.

#### 4-4. SERIAL TEST MODE

##### (1) Setting the serial test mode

The unit is put into the serial test mode when a serial code "TEST ON" is input during the POWER-ON sequence.

In the 16-bit serial test mode, serial code C27FH is input.

- In the serial test mode, all remote control keys and ordinary serial codes are disabled. Only the panel keys perform the same operation as usually.

##### (2) Canceling the serial test mode

- The serial test mode is canceled to return to the ordinary mode by inputting a "TEST OFF" code (C27 EH). After the ordinary mode was returned, the serial mode is returned to the state before the test mode is entered.
- The backup operation is not initialized.
- The serial test mode is also canceled when the AC power is turned OFF.

##### (3) Cautions

- The serial test code is prescribed as a 16-bit code only.
- The operations below are inhibited in the serial test mode. The operations mentioned above cannot be guaranteed when they are performed in the serial test mode.
- An identical code is output when the serial test mode code is input.

## CIRCUIT DESCRIPTION

## (4) SERIAL TEST CODE LIST(C2XXH)

TYPE FUNC	AMP								TUNER							
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	POWER OFF	CD DIRECT OFF	SP B OFF	DUAL SOUND LEVEL1	NB OFF	TV/SAT (TV/CABLE INPUT)	INPUT LEVEL MIN		POWER OFF	0	MEMORY (ENTER)					
1	POWER ON	CD DIRECT ON	SP B ON	DUAL SOUND LEVEL2	OMNI SP ON	FRONT SP ON	INPUT LEVEL MID		POWER ON	1	MAIN					
2	PHONO	CD REC OFF	HITMASTER OFF	DUAL SOUND LEVEL3	MUTING (-30dB) OFF	FRONT SP OFF	INPUT LEVEL MAX	LOW POWER MODE ON	MUTE OFF	2	SUB					
3	CD	CD REC ON	HITMASTER ON	DUAL SOUND INPUT CD	MUTING (-30dB) ON	C/S SP ON	DIMMER OFF	LOW POWER MODE OFF	MUTE ON	3	BOTH					
4	TUNER	SOURCE DIRECT OFF	MOTOR VOL UP	DUAL SOUND INPUT TUNER	NB LEVEL1	C/S SP OFF	DIMMER 1		AUTO STEREO	4	AF					
5	TAPE (TAPE A)	SOURCE DIRECT ON	MOTOR VOL DOWN	DUAL SOUND INPUT TAPE	NB LEVEL2	C/S MUTE ON	DIMMER 2		MONO	5	PTY					
6	TAPE2 (TAPE B)	LINE STRAIGHT OFF	MOTOR VOL STOP	DUAL SOUND INPUT MD/DAT	NB LEVEL3	VIDEO05	IR REPEATER TEST		TUNED OFF	6	DISPLAY					
7	AUX	SINE STRAIGHT ON	DBS/TV	DUAL SOUND INPUT VIDEO	BALANCE L/R MAX	MENU	MD (INPUT)		TUNED ON	7	ANTENNA A					
8	DAT	LOUDNESS OFF	TAPE2 MONITOR OFF	DUAL SOUND INPUT AV/AUX	BALANCE Lc/Rc CENTER	TONE CONTROL OFF	TV (INPUT)		ACTIVE RECEPTION OFF	8	ANTENNA B					
9	VIDEO1 (VIDEO)	LOUDNESS ON	TAPE2 MONITOR ON	BGH OFF	BALANCE R/L MAX	TONE CONTROL ON	CABLE/sat (INPUT)	FL ALL OFF OFF	ACTIVE RECEPTION ON	9	RS DISPLAY					FL ALL OFF OFF
A	VIDEO2	SUB SONIC OFF	VIDEO MUTE ON	BGM ON	L.A.C. MAIN MAX	BASS MIN	SUB MUTE ON	FL ALL OFF ON	ATT ON	+10	SIGNAL LEVEL DISP OFF					FL ALL OFF ON
B	VIDEO3	SUB SONIC ON	LAC VOL UP	FAN OFF	L.A.C. MAIN/SUB CENTER	BASS MID		ALL ON OFF	ATT OFF	BAND FM	SIGNAL LEVEL DISP ON					ALL ON OFF
C	VIDEO4 (VDP)	SUPER WOOFER OFF	LAC VOL DOWN	FAN ON	L.A.C. SUB MIN	BASS MIX	BASS DOWN	ALL ON ON	IF WIDE	BAND AM/FM	TUNER DIRECT (U-COM DATA)					ALL ON ON
D	MUTE ON (MAIN)	SUPER WOOFER ON	LAC VOL STOP	FAN SPEED LOW	FAN STOP LOW	TREBLE MIN	BASS UP	AMP INITIAL	IF NORMAL	BAND TV/LW						TUNER INITIAL
E	SEL MUTE ON	SPEAKER A OFF (FRONT)	DUAL SOUND OFF	FAN SPEED HIGH	FAN STOP HIGH	TREBLE MID	TREBLE DOWN	AMP SERIAL TEST OFF	IF NARROW	DOWN						TUNER SERIAL TEST OFF
F	MUTE ALL OFF	SPEAKER A ON (FRONT)	DUAL SOUND ON	NB ON	LD (INPUT)	TREBLE MAX	TREBLE UP	AMP SERIAL TEST ON	DIRECT	UP						TUNER SERIAL TEST ON

■ : SENDING CODE

■ : RECEIVING CODE

## (C3XXH)

TYPE FUNC	SURROUND								GE							
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0																
1																
2																
3																
4																
5																
6											M1 (ALL CEN)					
7											M2 (ALL MAX)					
8											M3 (ALL MIN)					
9											EEPROM TEST					
A																
B																
C																
D																
E																
F																

■ : SENDING CODE

■ : RECEIVING CODE

# R-SA7

## CIRCUIT DESCRIPTION

(C4XXH)

H L	VOLUME LEVEL															
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	VOLUME 0	VOLUME 16	VOLUME 32	VOLUME 48	VOLUME 64											
1	VOLUME 1	VOLUME 17	VOLUME 33	VOLUME 49	VOLUME 65											
2	VOLUME 2	VOLUME 18	VOLUME 34	VOLUME 50	VOLUME 66											
3	VOLUME 3	VOLUME 19	VOLUME 35	VOLUME 51	VOLUME 67											
4	VOLUME 4	VOLUME 20	VOLUME 36	VOLUME 52	VOLUME 68											
5	VOLUME 5	VOLUME 21	VOLUME 37	VOLUME 53	VOLUME $\infty$											
6	VOLUME 6	VOLUME 22	VOLUME 38	VOLUME 54	VOLUME 70											
7	VOLUME 7	VOLUME 23	VOLUME 39	VOLUME 55												
8	VOLUME 8	VOLUME 24	VOLUME 40	VOLUME 56												
9	VOLUME 9	VOLUME 25	VOLUME 41	VOLUME 57												
A	VOLUME 10	VOLUME 26	VOLUME 42	VOLUME 58												
B	VOLUME 11	VOLUME 27	VOLUME 43	VOLUME 59												
C	VOLUME 12	VOLUME 28	VOLUME 44	VOLUME 60												
D	VOLUME 13	VOLUME 29	VOLUME 45	VOLUME 61												
E	VOLUME 14	VOLUME 30	VOLUME 46	VOLUME 62												
F	VOLUME 15	VOLUME 31	VOLUME 47	VOLUME 63												

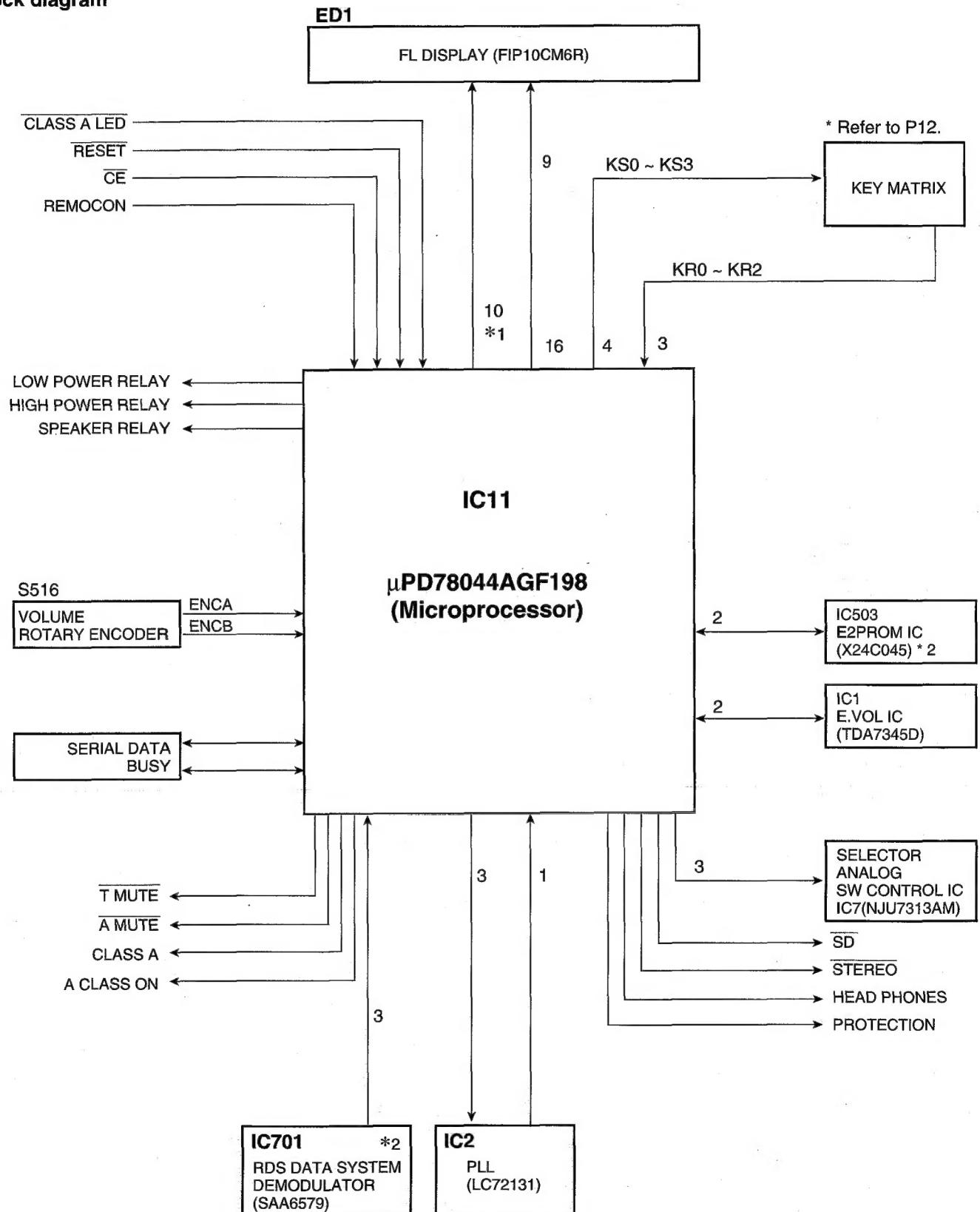
■ : SENDING CODE

■ : RECEIVING CODE

## CIRCUIT DESCRIPTION

## 5. Microprocessor : uPD78044AGF198 (X09 : IC11)

## Block diagram



\*1 GRID to FL

\*2 E/T Type (RDS feature installed) used RDS data system demodulator.

## CIRCUIT DESCRIPTION

## 5-1. Pin function

Pin NO.	Name	Port I/O	Description	Active
1	7G	O	FL grid 7	—
2	6G	O	FL grid 6	—
3	5G	O	FL grid 5	—
4	4G	O	FL grid 4	—
5	3G	O	FL grid 3	—
6	2G	O	FL grid 2	—
7	1G	O	FL grid 1	—
8	VDD	—	Micro processor power supply (+5V)	—
9	E2PROMSCL	O	E2PROM control clock	—
10	E2PROMSDA	O	E2PROM control data	—
11,12	NC	O		—
13	SCL	O	Electric volume IC control clock	—
14	SDA	O	Electric volume IC control data	—
15	A CLASS ON	O	Power ON/OFF control signal	H : ON      L : OFF
16	SEL STB	O	Selector IC strobe	—
17	RESET	I	Microprocessor reset	—
18	SEL/PLL CLK	O	SEL/PLL IC control clock	—
19	SEL/PLL DATA	O	SEL/PLL IC control data	—
20	AVSS	—	A/D power SUPPLY (GND)	—
21	AMUTE	O	Audio mute signal	—
22	TMUTE	O	Tuner mute signal	—
23	STEREO	I	Stereo signal detection	—
24	SD	I	Synchronized signal detection	—
25	PLL DO	O	IF count data	—
26	PLL CE	O	PLL Chip enable control	—
27	HEADPHONES	I	Head phones signal detection	H : ON      L : OFF
※28	S.LEVEL(RDS)	I	Signal level	—
29	AVDD	—	A/D power supply (+5V)	—
30	AVREF	—	A/D reference voltage(+5V)	—
31	OSC	—	32kHz oscillator	—
32	OSC	—	32kHz oscillator	—
33	Vss	—	Microprocesser power supply (GND)	—
34,35	OSC	—	4.19MHz oscillator	—
36	PROTECTION	I	Protection detection	H : ON      L : OFF
37	SP RELAY	O	Speaker relay control	H : ON      L : OFF
38	HIGH	O	AMP HIGH relay control	H : ON      L : OFF
39	CLASSA	O	CLASS A control signal	H : A CLASS      L : AB CLASS
40	LOW RELAY	O	AMP low relay control	H : ON      L : OFF

※ E/T type only, other types unused.

## CIRCUIT DESCRIPTION

Pin NO.	Name	Port I/O	Description	Active
41	S.DATA	I/O	16bit system data	—
42	S.BUSY	I/O	16 bit system busy	H:BUSY L:READY
43	NC	O		—
※44	CLK(RDS)	I	RDS clock	—
※ 45	DATA(RDS)	I	RDS data	—
46	NC	O		—
47	REMOCON	I	Remote control input	—
48	IC	—		—
49	ENCA	I	Volume encoder in put A	—
50	ENCB	I	Volume encoder input B	—
51	CLASS A LED	O	CLASS A LED	H:OFF L:ON
52	VDD	—	Microprocessor power supply (+5V)	—
53	NC	O		—
54	CE	I	AC OFF(MAIN POWER) detection Signal	L: AC OFF
55~57	NC	O		—
58	KR2	I	KEY return 2	H:KEY ON
59	KR1	I	KEY return 1	H:KEY ON
60	KR0	I	KEY return 0	H:KEY ON
61	P16/KS3	O	FL Segment 6 /key scan 3	H:ON
62	P15/KS2	O	FL Segment 5 /key scan 2	H:ON
63	P14/KS1	O	FL Segment 4/key scan 1	H:ON
64	P13/KS0	O	FL Segment 3/key scan 0	H:ON
65	P12	O	FL Segment 2	H:ON
66	P11	O	FL Segment 1	H:ON
67	P10	O	FL Segment 7	H:ON
68	P9	O	FL Segment 8	H:ON
69	P8	O	FL Segment 9	H:ON
70	P7	O	FL Segment 10	H:ON
71	V load	—	FL drive power supply (-30V)	—
72	P6	O	FL Segment 11	H:ON
73	P5	O	FL Segment 12	H:ON
74	P4	O	FL Segment 13	H:ON
75	P3	O	FL Segment 14	H:ON
76	P2	O	FL Segment 15	H:ON
77	P1	O	FL Segment 16	H:ON
78	10G	O	FL Segment 10	—
79	9G	O	FL grid 9	—
80	8G	O	FL grid 8	—

※ E/T type only, other types unused.

The RDS PTY AF search always corresponds to a span search of 100kHz. Therefore, a span search of 50 kHz cannot be performed.

# R-SA7

## CIRCUIT DESCRIPTION

### 6. KEY MATRIX

KRTN KSCN	KR0(60)	KR1(59)	KR2(58)
KS0(64)	POWER	AUTO/MONO	TUNINGDOWN
KS1(63)	N. B. CIRCUIT	CLASS A	TUNING UP
KS2(62)	INPUT	ENTER	BAND
KS3(61)	DIODE SW (D518)		

(Port# of microprocessor)

### 7. CIRCUIT DESCRIPTION.

R-SA7 uses switching circuit class-A and class-B in final stage of power amplifier.

#### CLASS-B

As Q25 has low signal from microprocessor and Q25 and PH1, both are turn-off.

Q27's bias is decided by R123, 127, and VR1. Bias current of Q21 and 23 is 30mA.

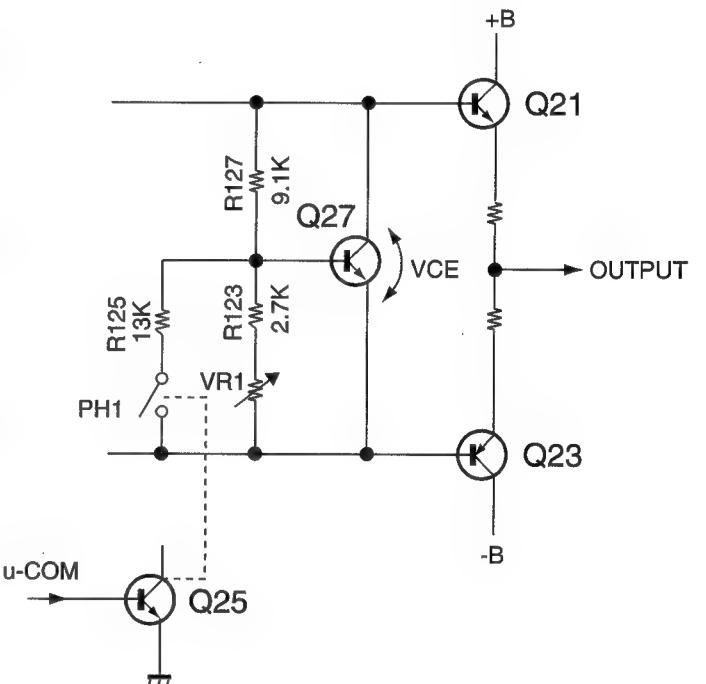
Power supply for Q21 and 23 is high tap(22V) of power transformer.

#### CLASS-A

As Q25 has high signal from microprocessor, Q25 and PH1 are turn-on.

Q27's bias is decided by R123, 127, VR1 and 125. Bias current of Q21 and 23 is increased by rising up Vce of Q27.

Heat loss is big in class-a. Power supply for Q21 and 23 is low tap(10V) of that for protecting power transistors.



## ADJUSTMENT

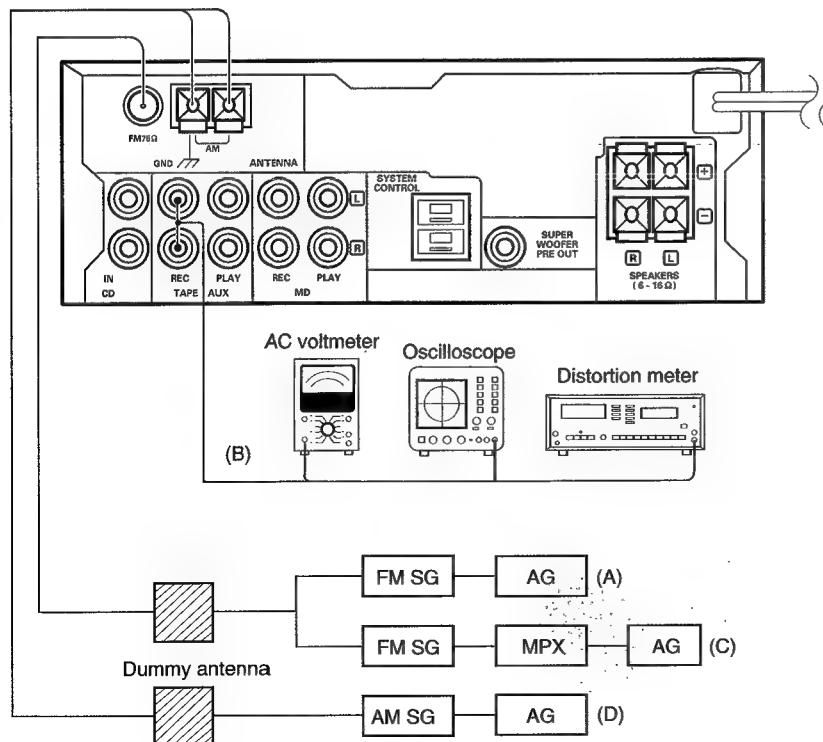
FM SECTION SELECTION :FM  
X05-4622-70 (E/T TYPE)

NO.	ITEM	INPUT SETTINGS	OUTPUT SETTINGS	TUNER SETTINGS	ALIGNMENT POINTS	ALIGN FOR	FIG.
1	DISCRIMINATOR	(A) 98.0kHz 1kHz, $\pm 75$ kHz dev. 60dB $\mu$ (ANT input)	Connect a DC voltmeter between Pin 1 and Pin 2 of CN 2.	MONO 98.0MHz	L 31	0V	(a)
					L 32	Minimum distortion.	
2	DISTORTION (STEREO)	(C) 98.0MHz 1kHz, $\pm 68.25$ kHz dev. Pilot: $\pm 6.75$ kHz dev. 60dB $\mu$ (ANT input)	(B)	AUTO 98.0MHz	IFT (A1)	Minimum distortion.	(a)

## AUDIO SECTION (X09-4462-71)

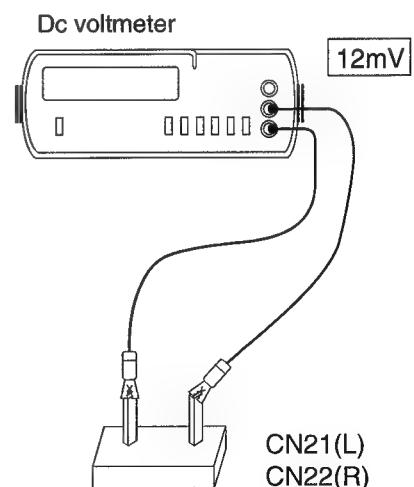
NO.	ITEM	INPUT SETTINGS	OUTPUT SETTINGS	AMP SETTINGS	ALIGNMENT POINTS	ALIGN FOR	FIG.
POWER: ON SPEAKER: B REC OUT: OFF							
1	B CLASS IDLE CURRENT	—	Connect a DC voltmeter across CN21(L) CN22(R) (X09, A/8)	PURE A: OFF Volume : 0	VR1(L) VR2(R) (X09, A/8)	12mV	(b)
2	A CLASS IDLE CURRENT	—		PURE A: ON Volume : 0		Less than 260mV. (Check)	

(a)

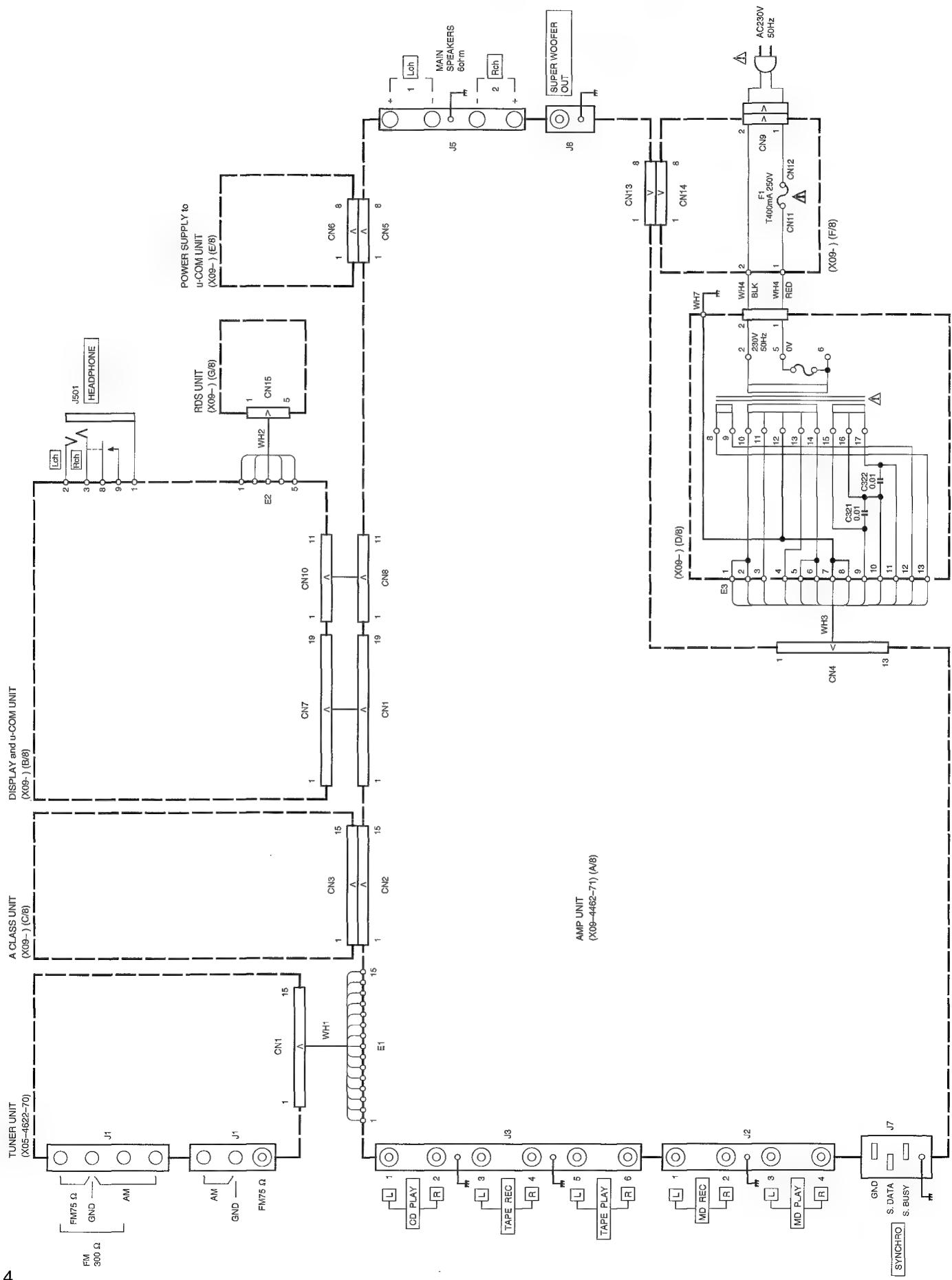


(b)

## System connections



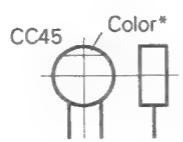
## WIRING DIAGRAM



## PARTS DESCRIPTIONS

**CAPACITORS** CC 45 TH 1H 220 J  
 1 2 3 4 5 6

1 = Type ... ceramic, electrolytic, etc. 4 = Voltage rating  
 2 = Shape ... round, square, ect. 5 = Value  
 3 = Temp. coefficient 6 = Tolerance



## • Capacitor value

010 = 1pF	2	2	0 = 22pF
100 = 10pF			Multiplier
101 = 100pF			2nd number
102 = 1000pF = 0.001μF			1st number
103 = 0.01μF			

## • Temperature coefficient

1st Word	C	L	P	R	S	T	U
Color*	Black	Red	Orange	Yellow	Green	Blue	Violet
ppm/°C	0	-80	-150	-220	-330	-470	-750

2nd Word	G	H	J	K	L
ppm/°C	±30	±60	±120	±250	±500

Example : CC45TH =  $-470 \pm 60 \text{ ppm/}^{\circ}\text{C}$

## • Tolerance (More than 10pF)

Code	C	D	G	J	K	M	X	Z	P	No code
(%)	±0.25	±0.5	±2	±5	±10	±20	+40	+80	+100	More than 10μF -10 ~ +50

## (Less than 10pF)

Code	B	C	D	F	G
(pF)	±0.1	±0.25	±0.5	±1	±2

## • Voltage rating

2nd word	A	B	C	D	E	F	G	H	J	K	V
1st word											
0	1.0	1.25	1.6	2.0	2.5	3.15	4.0	5.0	6.3	8.0	-
1	10	12.5	16	20	25	31.5	40	50	63	80	35
2	100	125	160	200	250	315	400	500	630	800	-
3	1000	1250	1600	2000	2500	3150	4000	5000	6300	8000	-

## • Chip capacitors

(EX) C C 7 3 F S L 1 H 0 0 0 J  
 1 2 3 4 5 6 7

## Dimension (Chip capacitors)

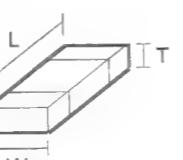
Dimension code	L	W	T
Empty	5.6 ± 0.5	5.0 ± 0.5	Less than 2.0
A	4.5 ± 0.5	3.2 ± 0.4	Less than 2.0
B	4.5 ± 0.5	2.0 ± 0.3	Less than 2.0
C	4.5 ± 0.5	1.25 ± 0.2	Less than 1.25
D	3.2 ± 0.4	2.5 ± 0.3	Less than 1.5
E	3.2 ± 0.2	1.6 ± 0.2	Less than 1.25
F	2.0 ± 0.3	1.25 ± 0.2	Less than 1.25
G	1.6 ± 0.2	0.8 ± 0.2	Less than 1.0

(Chip) (CH, RH, UJ, SL)

(EX) C K 7 3 F F 1 H 0 0 0 Z  
 1 2 3 4 5 6 7

(Chip) (B, F)

## Dimension



## Dimension (Chip resistor)

Dimension code	L	W	T
E	3.2 ± 0.2	1.6 ± 0.2	1.0
F	2.0 ± 0.3	1.25 ± 0.2	1.0
G	1.6 ± 0.2	0.8 ± 0.2	0.5 ± 0.1

## • Carbon resistor (Normal type)

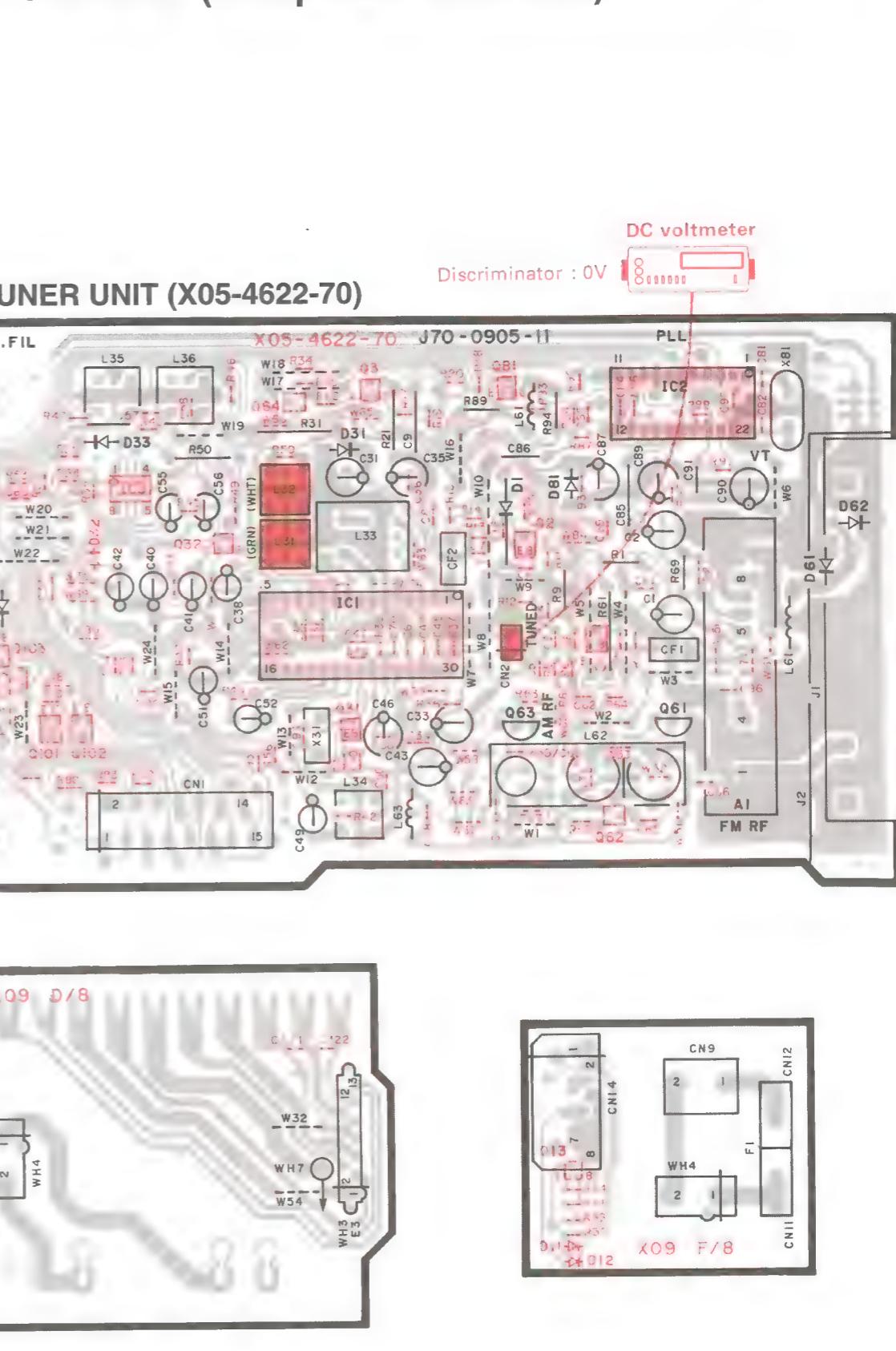
(EX) R D 1 4 B B 2 C 0 0 0 J  
 1 2 3 4 5 6 7

1 = Type  
 2 = Shape  
 3 = Dimension  
 4 = Temp. coefficient  
 5 = Rating wattage  
 6 = Value  
 7 = Tolerance

## Rating wattage

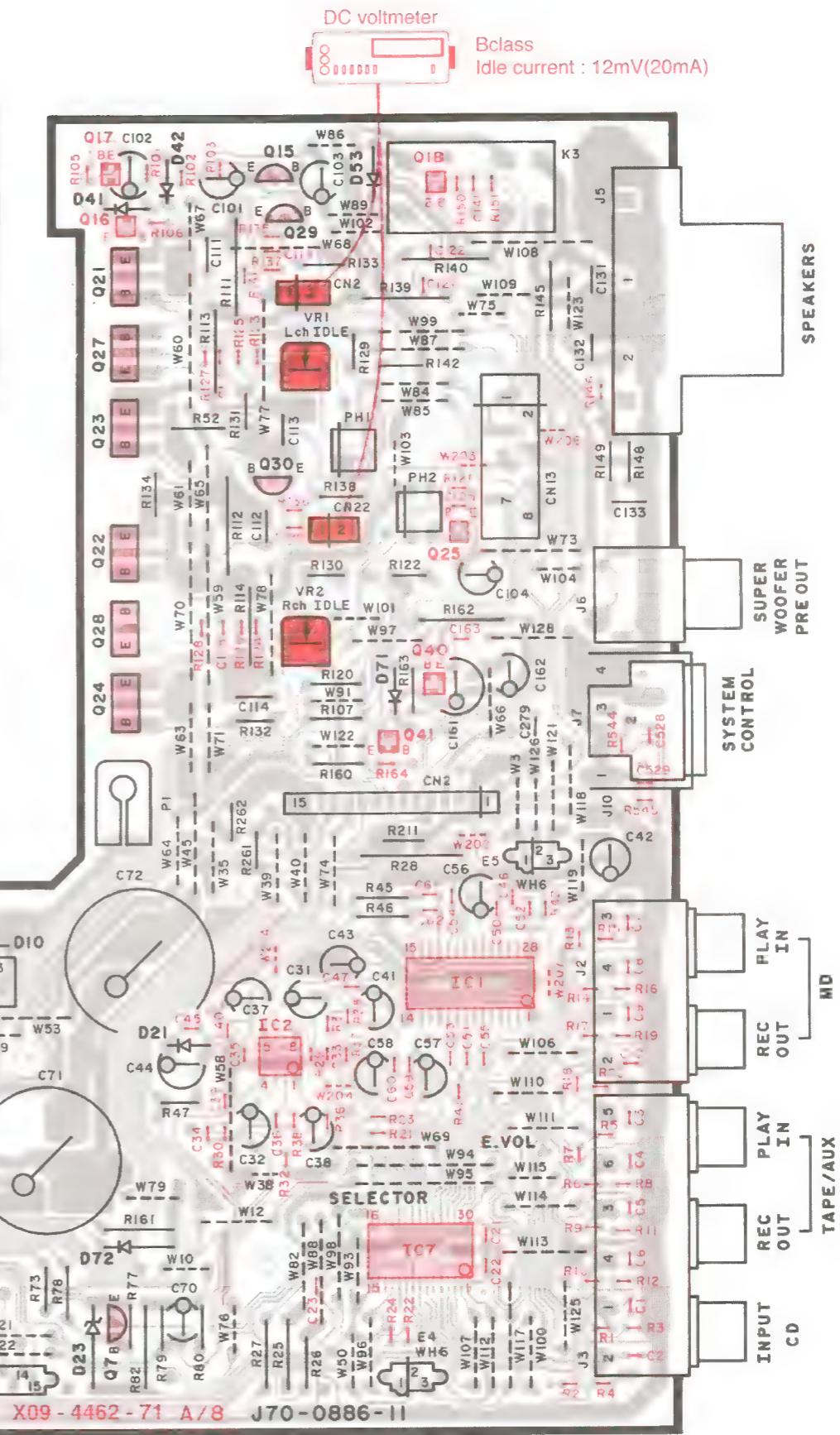
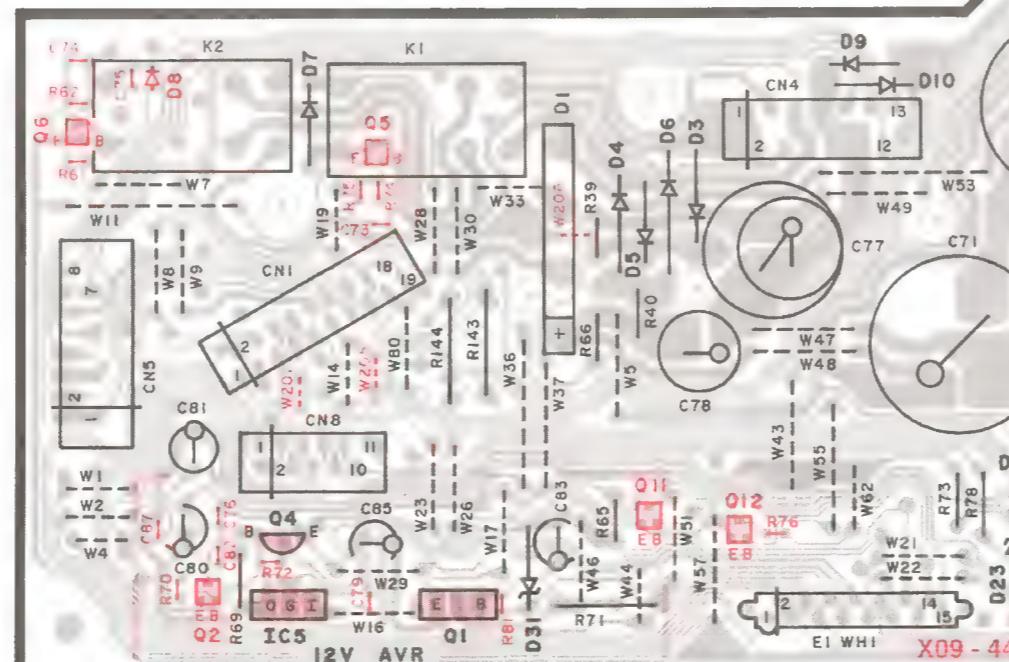
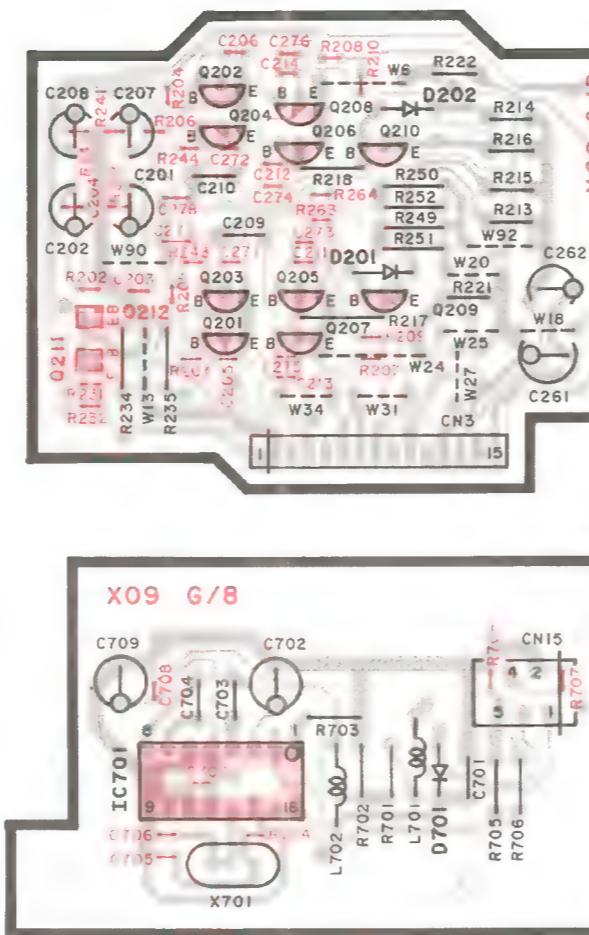
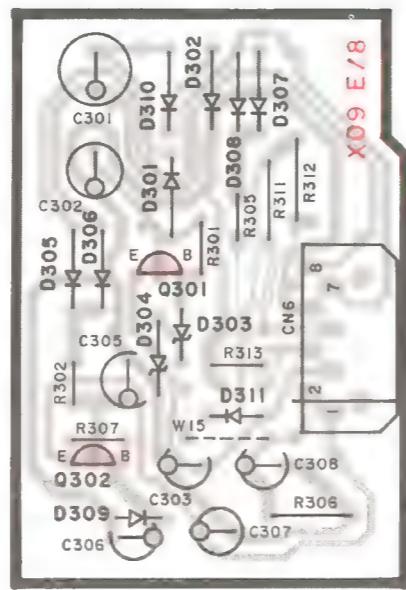
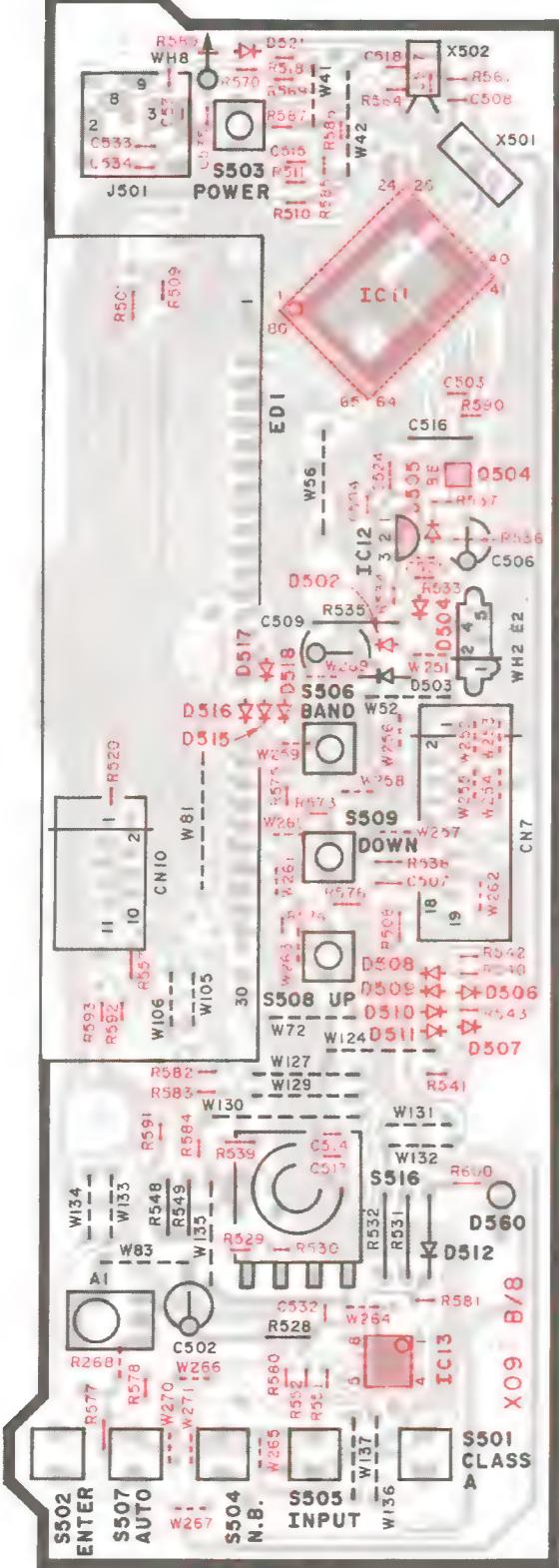
Code	Wattage	Code	Wattage	Code	Wattage
1J	1/16W	2C	1/6W	3A	1W
2A	1/10W	2E	1/4W	3D	2W
2B	1/8W	2H	1/2W		

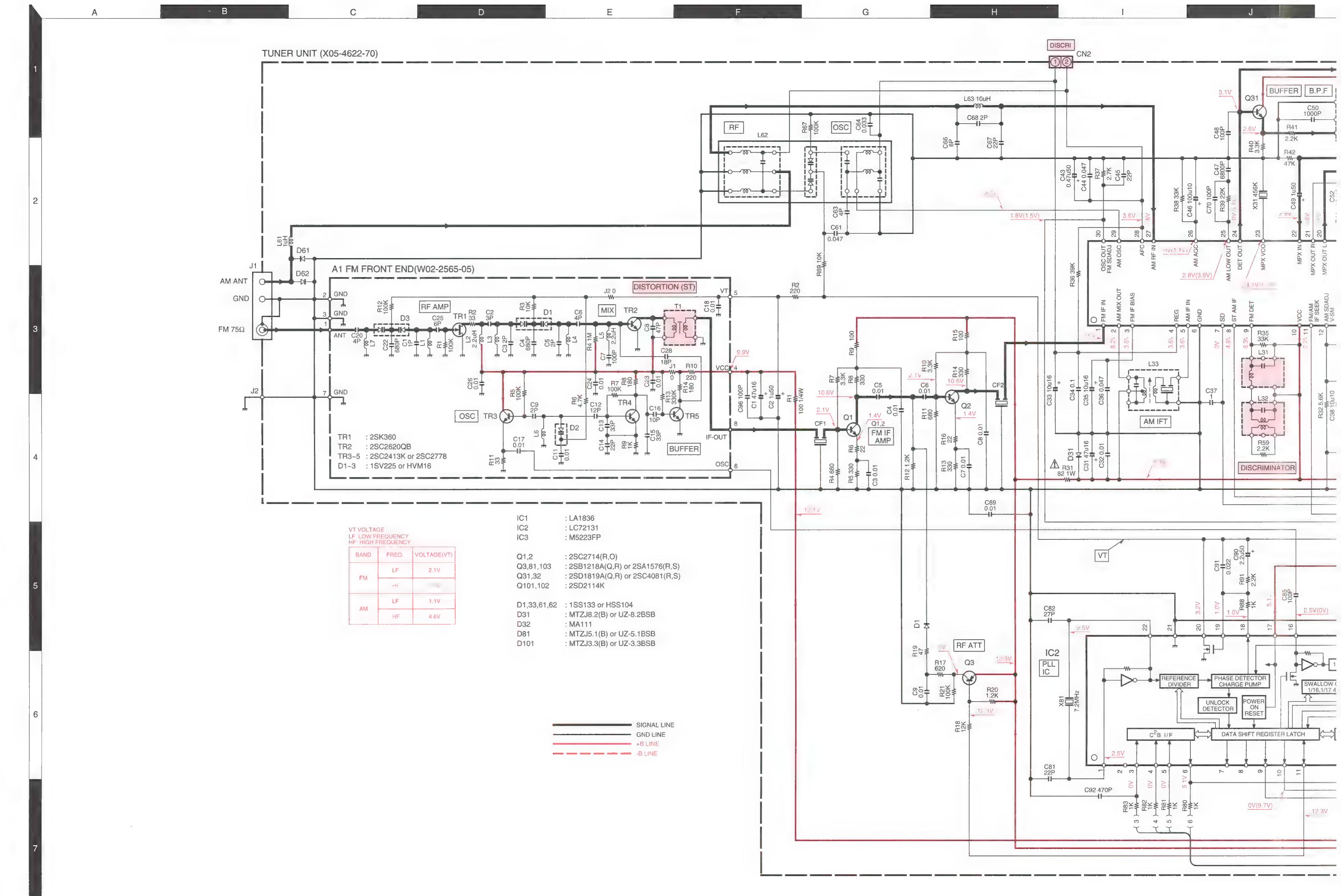
## PC BOARD (Component side view)

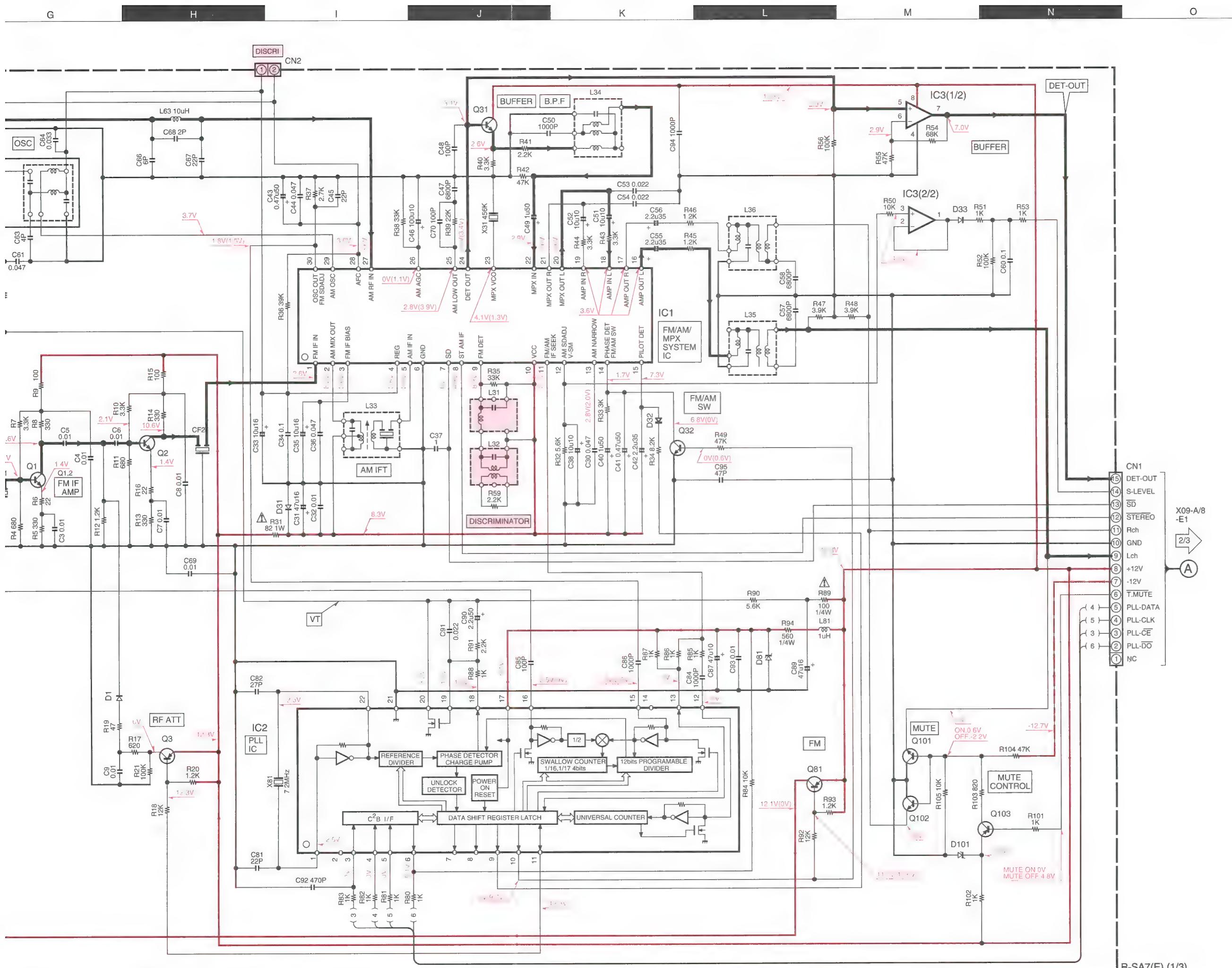


## PC BOARD(Component side view)

## **AUDIO UNIT (X09-4462-71)**

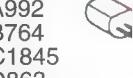




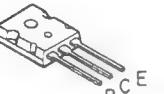


**CAUTION:** For correct installation, use the manufacturer's recommended components. For correct type and rating fuses, use fuses that are not resistance measured insulated from the

2SA1534A  
2SA992  
2SB764  
2SC1845  
2SD863



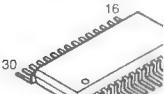
2SC4137F50

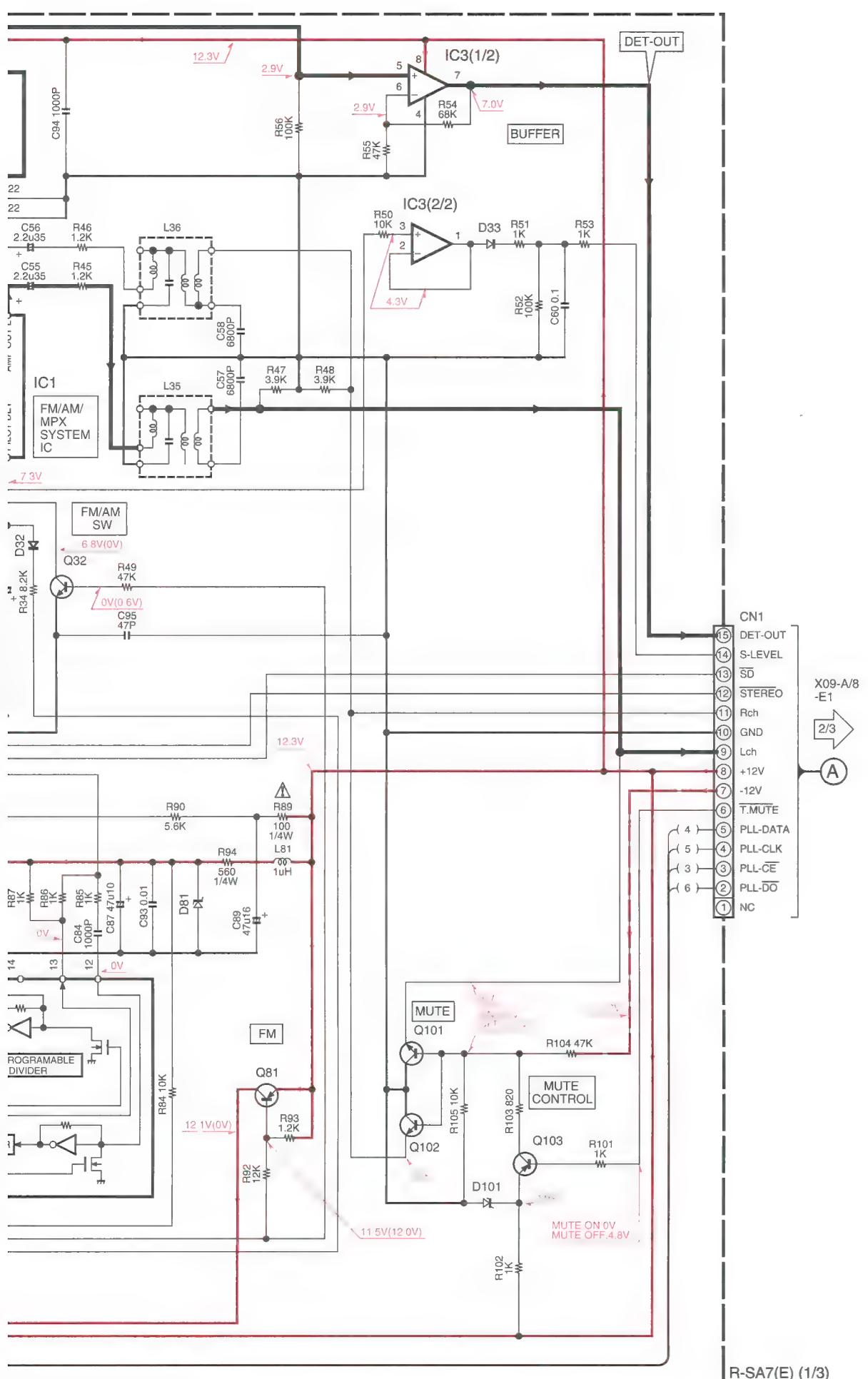


UN5212



NJU7313A

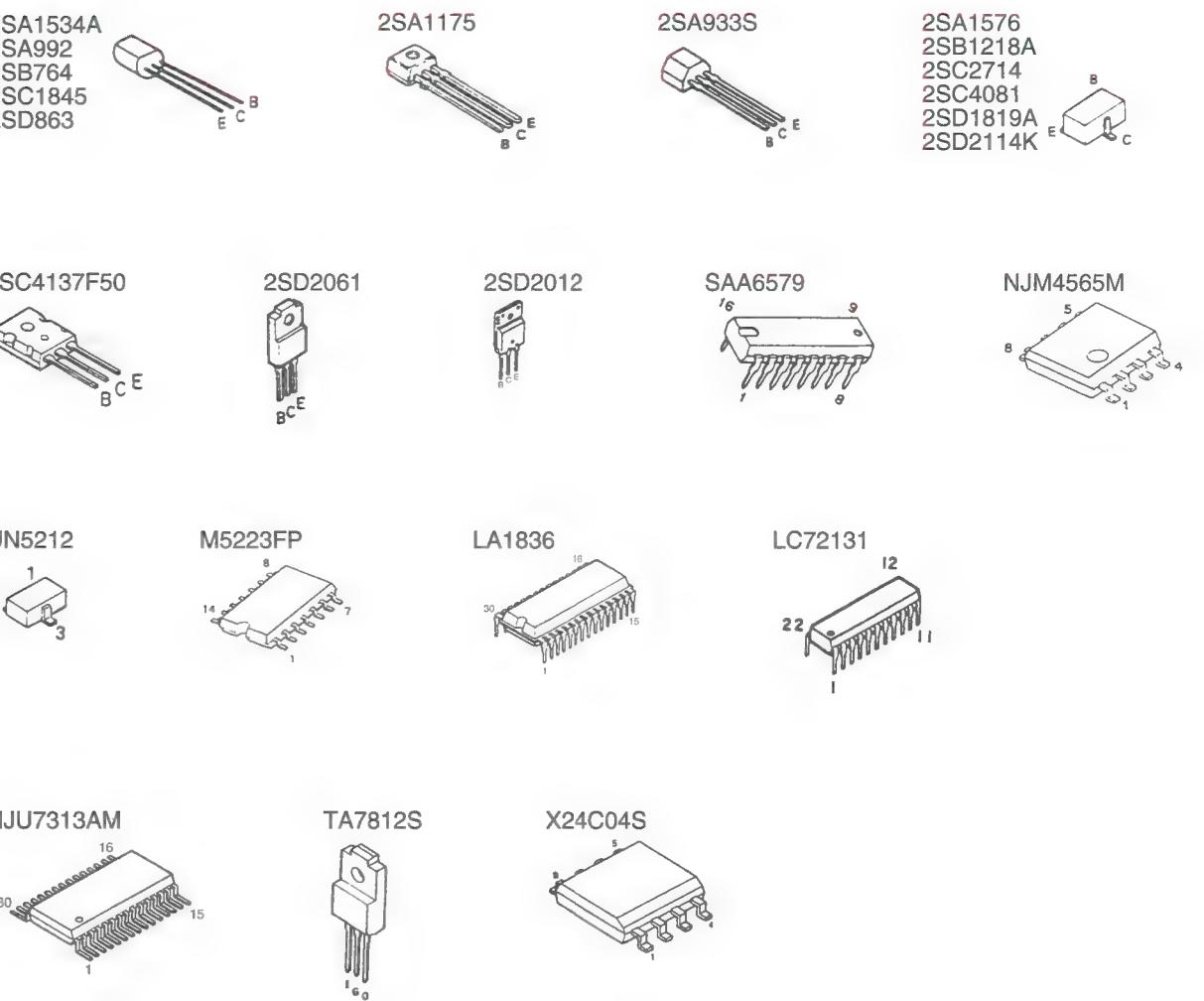




R-SA7(E) (1/3)

**CAUTION:** For continued safety, replace safety critical components only with manufacturer's recommended parts (refer to parts list).  $\Delta$  indicates safety critical components. For continued protection against risk of fire, replace only with same type and rating fuse(s). To reduce the risk of electric shock, leakage-current or resistance measurements shall be carried out (exposed parts are acceptably insulated from the supply circuit) before the appliance is returned to the customer.

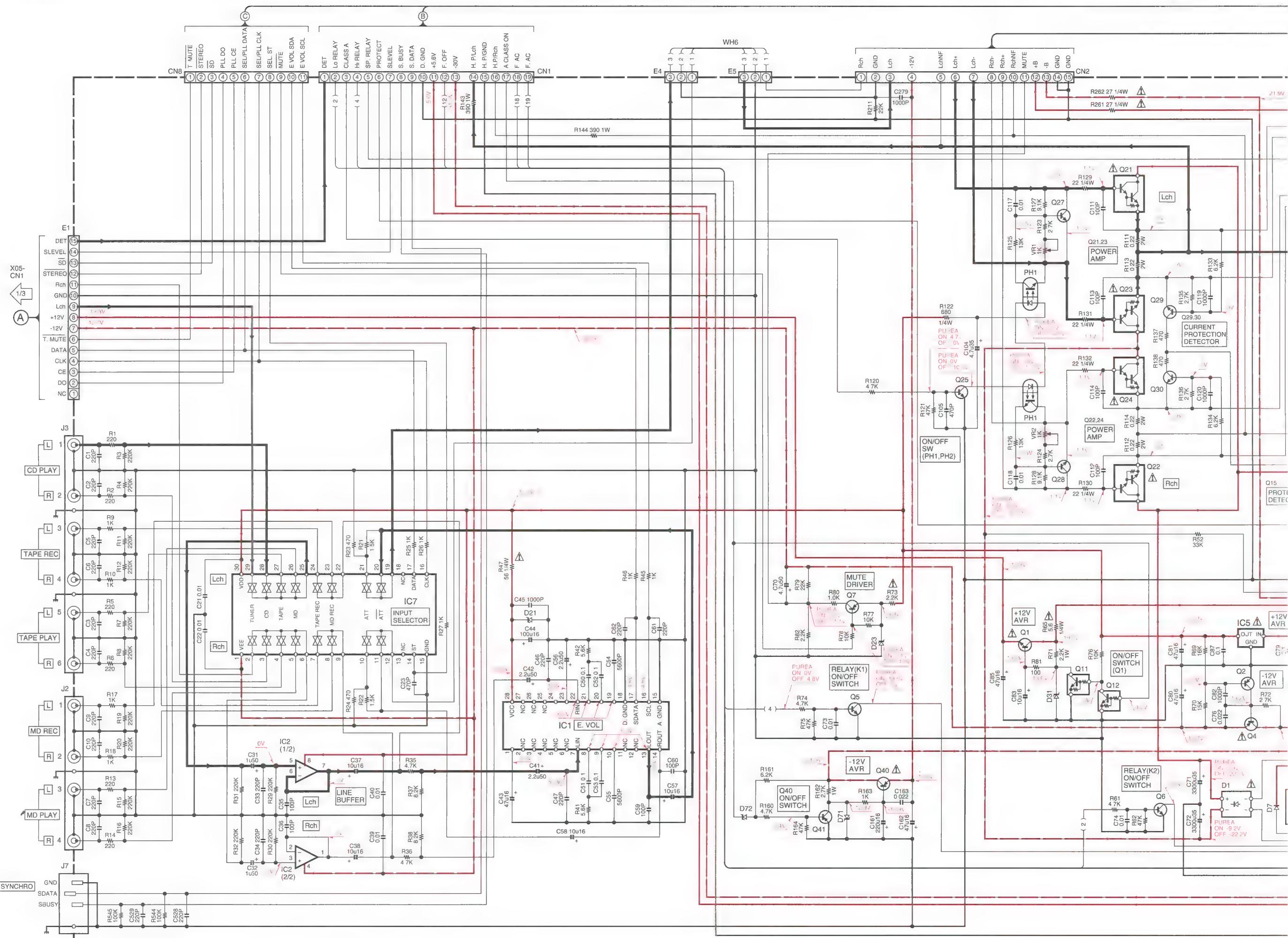
The DC voltage is an actual reading measured with a high impedance type voltmeter with no signal input. The measurement value may vary depending on the measuring instruments used or on the product.

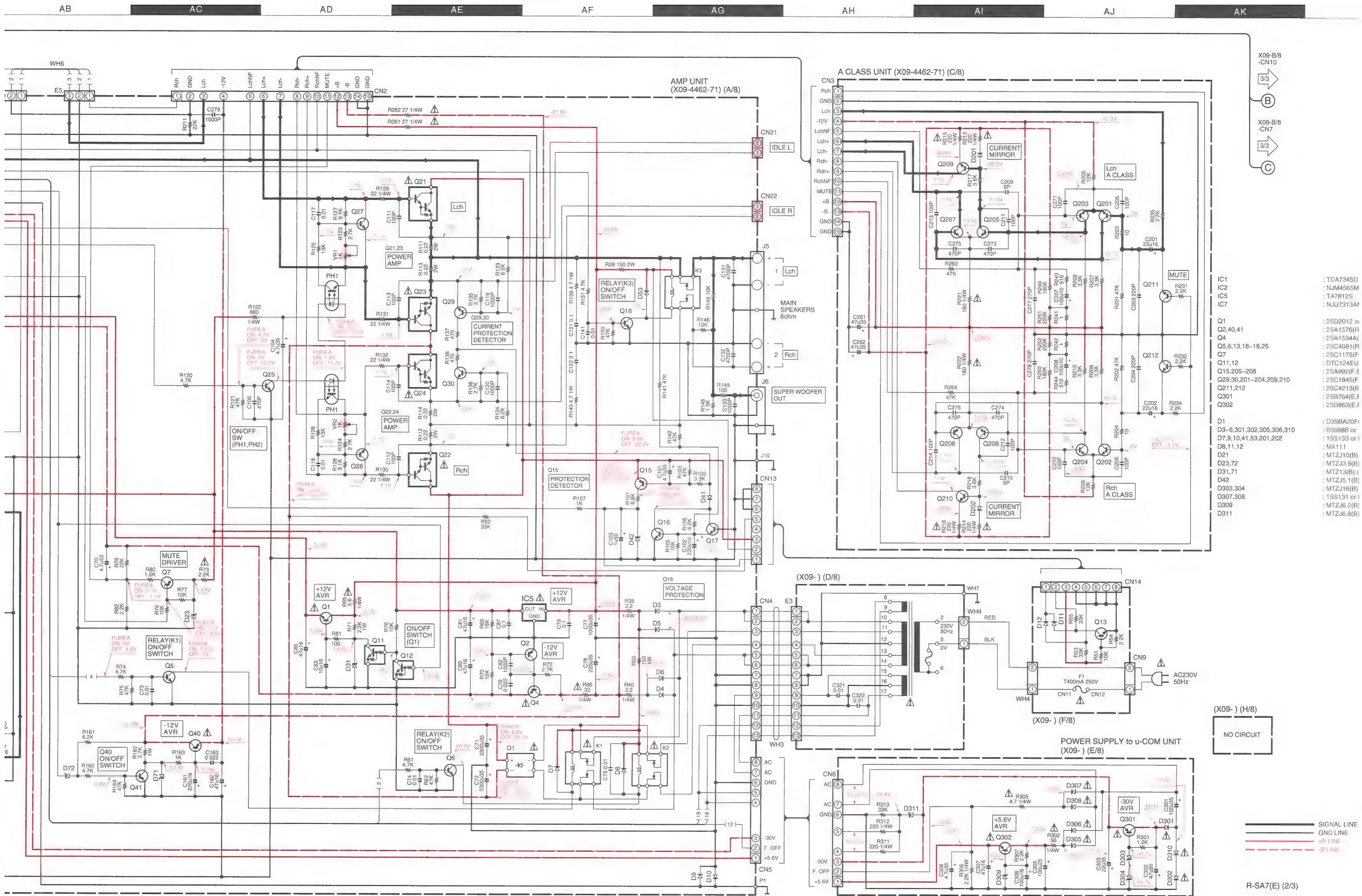


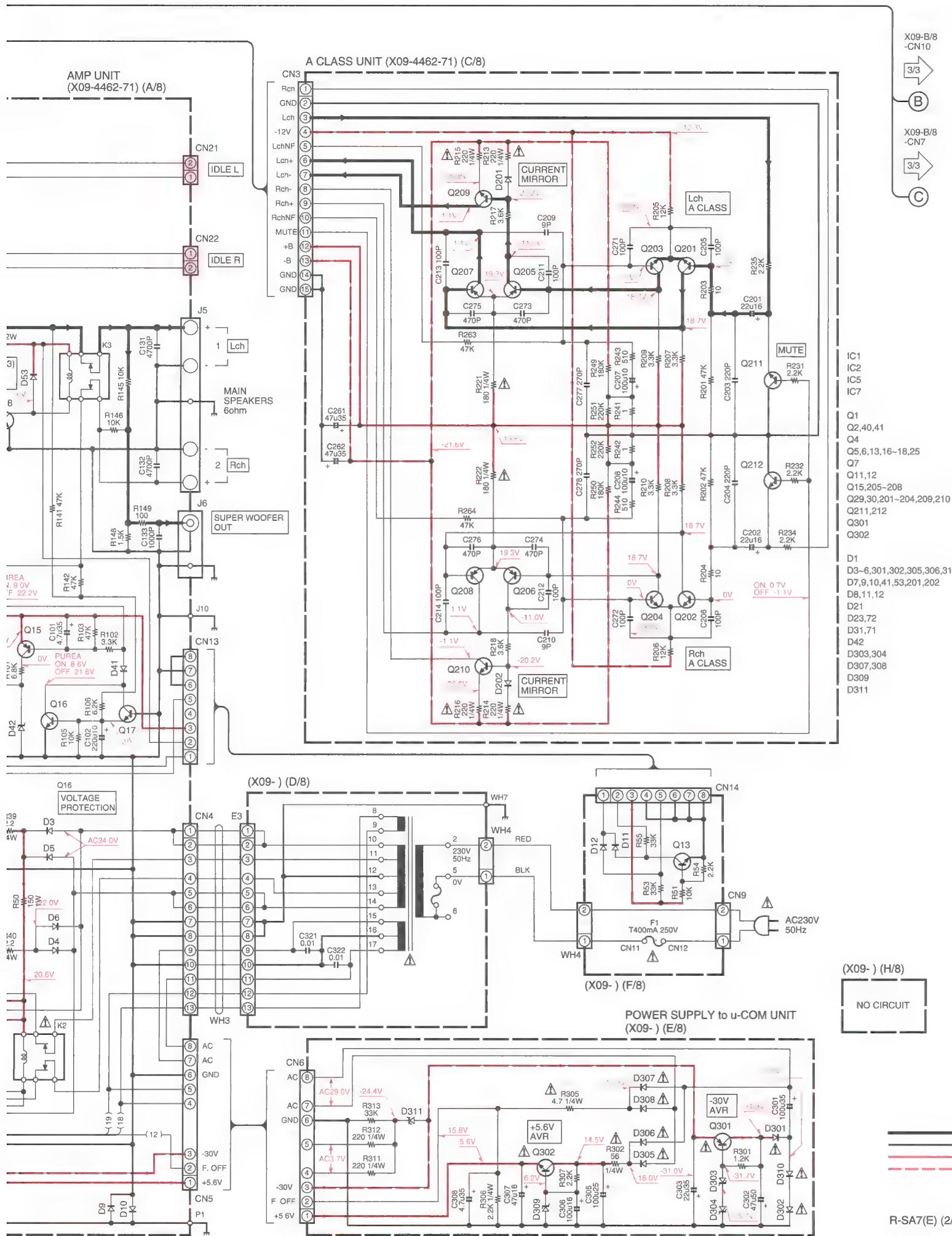
R-SA7

Y05-3242-71

KENWOOD







**CAUTION:** For continued safety, replace safety critical components only with manufacturer's recommended parts (refer to parts list).  $\triangle$  indicates safety critical components. For continued protection against risk of fire, replace only with same type and rating fuse(s). To reduce the risk of electric shock, leakage-current or resistance measurements shall be carried out (exposed parts are acceptably insulated from the supply circuit) before the appliance is returned to the customer.

The DC voltage is an actual reading measured with a high impedance type voltmeter with no signal input. The measurement value may vary depending on the measuring instruments used or on the product.

: TDA7345D  
: NJM4565M  
: TA7812S  
: NJU7313AM

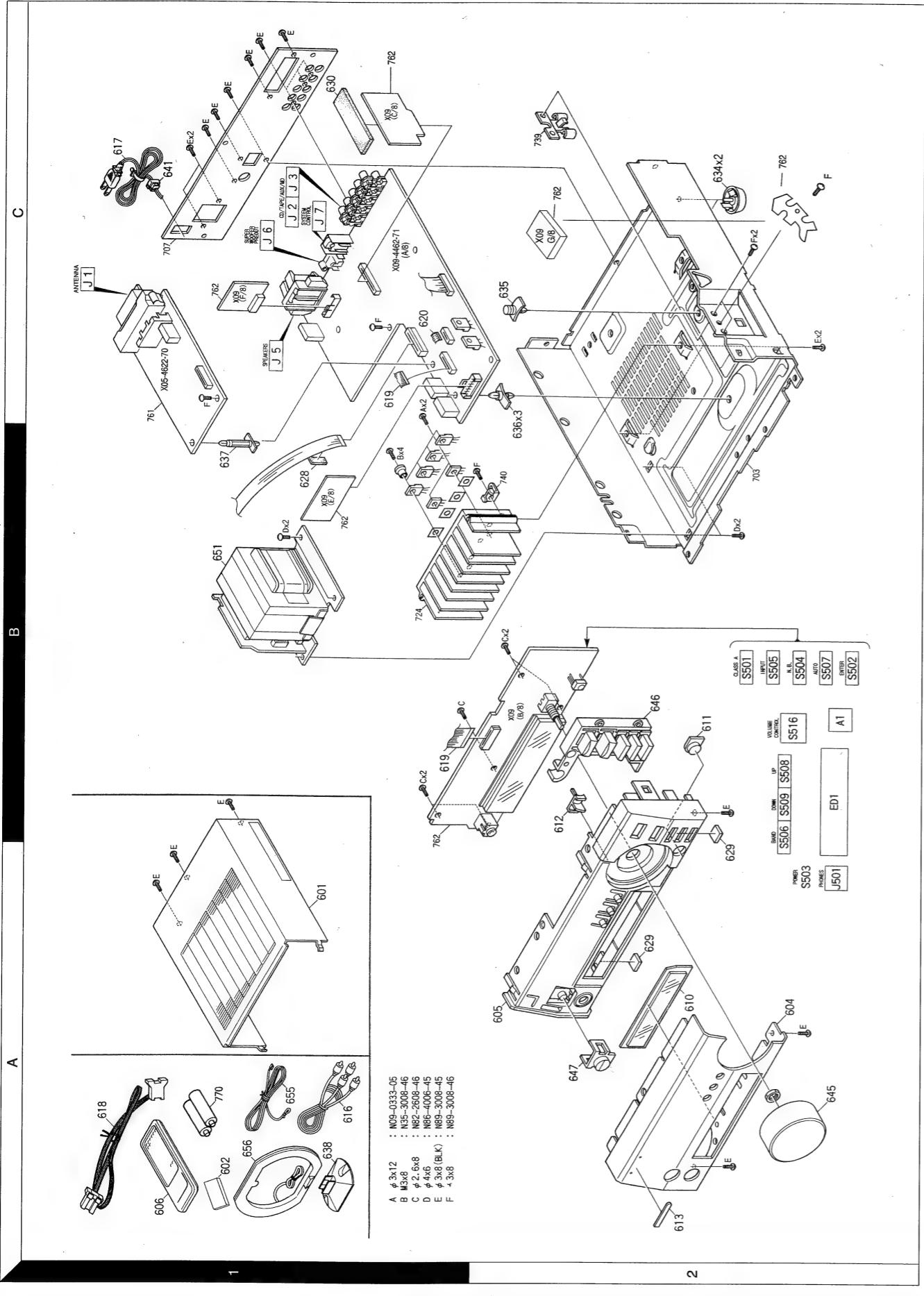
- : 2SD2012 or 2SD2061(E,F)
- : 2SA1576(R,S)
- : 2SA1534A(R,S)
- : 2SC4081(R,S)
- : 2SC1175(F,E) or 2SA933S(Q,R)
- : DTC124EU or UN5212
- : 2SA992(F,E)
- : 2SC1845(F,E)
- : 2SC4213(B)
- : 2SB764(E,F)
- : 2SD863(E,F)

: D3S8A20F03 or RBV-402LFA  
: B5688B or 1SR139-100  
: 1SS131 or HSS104  
: MA111  
: MTZJ10(B) or UZ-10BSB  
: MTZJ3.9(B) or UZ-3.9BSB  
: MTZJ13(B) or UZ-13BSB  
: MTZJ5.1(B) or UZ-5.1BSB  
: MTZJ16(B) or UZ-16BSB  
: 1SS131 or HSS104A  
: MTZJ6.2(B) or UZ-6.2BSB  
: MTZJ6.8(B) or UZ-6.8BSB

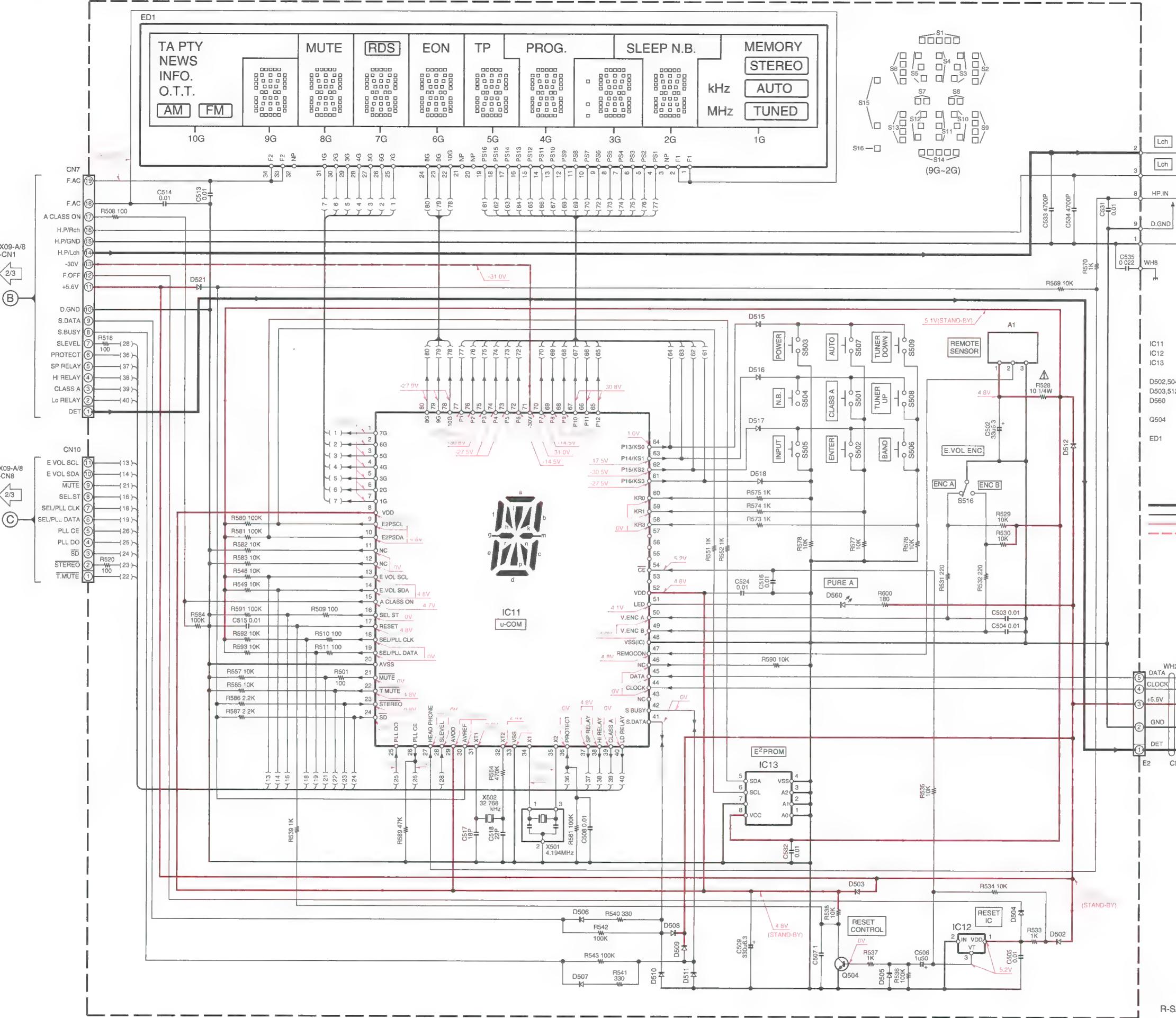
(X09- ) (H/8)

R-SA7(E) (2/

R-SA7  
KENWOOD



## DISPLAY and u-COM UNT (X09-4462-71) (B/8)



**CAUTION:** For continued safety, replace safety critical components only with manufacturer's recommended parts (refer to parts list).  $\Delta$  indicates safety critical components. For continued protection against risk of fire, replace only with same type and rating fuse(s). To reduce the risk of electric shock, leakage-current or resistance measurements shall be carried out (exposed parts are acceptably insulated from the supply circuit) before the appliance is returned to the customer.

The DC voltage is an actual reading measured with a high impedance type voltmeter with no signal input. The measurement value may vary depending on the measuring instruments used or on the product.

:uPD78044AGF198  
:S-806D-Z  
:X24C04S

:MA111  
:1SS133 or HSS104  
:B30-2467-05

:2SC4081(R,S)

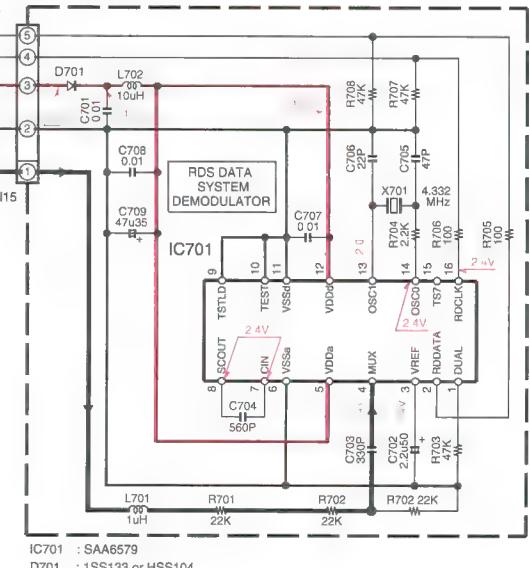
:FIP10CM6R

SIGNAL LINE

GND LINE

B-LINE

## RDS UNIT (X09-4462-21) (G/8)



R-SA7(E) (3/3)

Y05-3240-00

R-SA7

KENWOOD

\* New Parts  
Parts without **Parts No.** are not supplied.  
Les articles non mentionnés dans le **Parts No.** ne sont pas fournis.  
Teile ohne **Parts No.** werden nicht geliefert.

3

\* New Parts  
Parts without **Parts No.** are not supplied.  
Les articles non mentionnés dans le **Parts No.** ne sont pas fournis.  
Teile ohne **Parts No.** werden nicht geliefert.

4

Ref. No	Address	New Parts	Parts No.	Description		Desti- nation	Re- marks
CN2			E40-4871-05	PIN ASSY			
J1			E20-0321-05	LOCK TERMINAL BOARD(2P,F)			
J1			E70-0052-05	LOCK TERMINAL BOARD			
J2			F10-1053-04	SHIELDING PLATE			
CF1,2			L72-0536-05	CERAMIC FILTER			
L31	*		L30-0929-05	FM IFT			
L32	*		L30-0930-05	FM IFT			
L33			L30-0911-05	AM IFT			
L34			L79-1237-05	LC FILTER			
L35,36			L79-1236-05	LC FILTER			
L61			L40-1091-17	SMALL FIXED INDUCTOR(1UH)			
L62			L39-1348-05	COMBINATION COIL			
L63			L40-1001-17	SMALL FIXED INDUCTOR(10UH,K)			
L81			L40-1091-17	SMALL FIXED INDUCTOR(1UH)			
X31			L78-0637-05	RESONATOR (456KHZ)			
X81			L77-1122-05	CRYSTAL RESONATOR(7.2MHZ)			
R1			RD14NB2E101J	RD	100	J	1/4W
R2			RK73EB2B221J	CHIP R	220	J	1/8W
R4			RK73FB2A681J	CHIP R	680	J	1/10W
R5			RK73FB2A331J	CHIP R	330	J	1/10W
R6			RK73FB2A220J	CHIP R	22	J	1/10W
R7			RK73FB2A332J	CHIP R	3.3K	J	1/10W
R8			RK73FB2A331J	CHIP R	330	J	1/10W
R10			RK73FB2A332J	CHIP R	3.3K	J	1/10W
R11			RK73FB2A681J	CHIP R	680	J	1/10W
R12			RK73FB2A122J	CHIP R	1.2K	J	1/10W
R13,14			RK73FB2A331J	CHIP R	330	J	1/10W
R15			RK73FB2A101J	CHIP R	100	J	1/10W
R16			RK73FB2A220J	CHIP R	22	J	1/10W
R17			RK73FB2A621J	CHIP R	620	J	1/10W
R18			RK73FB2A123J	CHIP R	12K	J	1/10W
R19			RK73FB2A470J	CHIP R	47	J	1/10W
R20			RK73FB2A122J	CHIP R	1.2K	J	1/10W
R31			RS14KB3A820J	FL-PROOF RS	82	J	1W
R32			RK73EB2B562J	CHIP R	5.6K	J	1/8W
R33			RK73FB2A302J	CHIP R	3.0K	J	1/10W
R34			RK73FB2A822J	CHIP R	8.2K	J	1/10W
R35			RK73FB2A333J	CHIP R	33K	J	1/10W
R36			RK73FB2A393J	CHIP R	39K	J	1/10W
R37			RK73FB2A272J	CHIP R	2.7K	J	1/10W
R38			RK73FB2A333J	CHIP R	33K	J	1/10W
R39			RK73FB2A223J	CHIP R	22K	J	1/10W
R40			RK73FB2A332J	CHIP R	3.3K	J	1/10W
R41			RK73FB2A222J	CHIP R	2.2K	J	1/10W
R42			RK73FB2A473J	CHIP R	47K	J	1/10W
R43,44			RK73FB2A332J	CHIP R	3.3K	J	1/10W
R45,46			RK73FB2A122J	CHIP R	1.2K	J	1/10W
R47,48			RK73FB2A392J	CHIP R	3.9K	J	1/10W
R49			RK73FB2A473J	CHIP R	47K	J	1/10W
R51			RK73FB2A102J	CHIP R	1.0K	J	1/10W
R52			RK73FB2A104J	CHIP R	100K	J	1/10W
R53			RK73FB2A102J	CHIP R	1.0K	J	1/10W
R54			RK73FB2A683J	CHIP R	68K	J	1/10W

L : Scandinavia  
Y : PX(Far East, Hawaii)  
Y : AA=ES(Europe)

K : USA  
T : Europe  
X : Australia

P : Canada  
E : Europe  
M : Other Areas

R : Mexico  
G : Germany

▲ indicates safety critical components.

Ref. No	Address	New Parts	Parts No.	Description		Desti- nation	Re- marks
R55			RK73FB2A473J	CHIP R	47K	J	1/10W
R56			RK73FB2A104J	CHIP R	100K	J	1/10W
R59			RK73FB2A222J	CHIP R	2.2K	J	1/10W
R67			RK73FB2A104J	CHIP R	100K	J	1/10W
R80			RK73EB2B102J	CHIP R	1.0K	J	1/8W
R81-83			RK73FB2A102J	CHIP R	1.0K	J	1/10W
R84			RK73FB2A103J	CHIP R	10K	J	1/10W
R85-88			RK73FB2A102J	CHIP R	1.0K	J	1/10W
R89			RD14NB2E101J	RD	100	J	1/4W
R90			RK73FB2A562J	CHIP R	5.6K	J	1/10W
R91			RK73FB2A222J	CHIP R	2.2K	J	1/10W
R92			RK73FB2A123J	CHIP R	12K	J	1/10W
R93			RK73FB2A122J	CHIP R	1.2K	J	1/10W
R94			RD14NB2E561J	RD	560	J	1/4W
R101,102			RK73FB2A102J	CHIP R	1.0K	J	1/10W
R103			RK73FB2A821J	CHIP R	820	J	1/10W
R104			RK73FB2A473J	CHIP R	47K	J	1/10W
R105			RK73FB2A103J	CHIP R	10K	J	1/10W
W51-54			R92-0670-05	CHIP R	0 OHM		
W56-58			R92-0679-05	CHIP R	0 OHM		
W59-61			R92-0670-05	CHIP R	0 OHM		
W62-67			R92-0679-05	CHIP R	0 OHM		
W69-71			R92-0670-05	CHIP R	0 OHM		
W80			R92-0679-05	CHIP R	0 OHM		
W81			R92-0679-05	CHIP R	0 OHM		
W83,84			R92-0679-05	CHIP R	0 OHM		
D1			HSS104	DIODE			
D1			1SS133	DIODE			
D31			MTZJ8.2(B)	ZENER DIODE			
D31			UZ-8.2BSB	ZENER DIODE			
D32			MA111	ZENER DIODE			
D33			HSS104	DIODE			
D33			1SS133	DIODE			
D61,62			HSS104	DIODE			
D61,62			1SS133	DIODE			
D81			MTZJ5.1(B)	ZENER DIODE			
D81			UZ-5.1BSB	ZENER DIODE			
D101			MTZJ3.3(B)	ZENER DIODE			
D101			UZ-3.3BSB	ZENER DIODE			
IC1			LA1836	ANALOGUE IC			
IC2			LC72131	MOS-IC			
IC3			M5223FP	IC(OP AMP X4)			
Q1,2			2SC2714(R,O)	TRANSISTOR			
Q3			2SA1576(R,S)	TRANSISTOR			
Q3			2SB1218A(Q,R)	TRANSISTOR			
Q31,32			2SC4081(R,S)	TRANSISTOR			
Q31,32			2SD1819A(Q,R)	TRANSISTOR			
Q81			2SA1576(R,S)	TRANSISTOR			
Q81			2SB1218A(Q,R)	TRANSISTOR			
Q101,102			2SD2114K	TRANSISTOR			
Q103			2SA1576(R,S)	TRANSISTOR			
Q103			2SB1218A(Q,R)	TRANSISTOR			
A1			W02-2565-05	FM FRONT-END ASSY			

L : Scandinavia  
Y : PX(Far East, Hawaii)  
Y : AAFES(Europe)

K : USA  
T : Europe  
X : Australia

P : Canada  
E : Europe  
M : Other Areas

R : Mexico  
G : Germany

▲ indicates safety critical components.

3

R-SAT

PARTS LIST

\* New Parts

Parts without **Parts No.** are not supplied.Les articles non mentionnés dans le **Parts No.** ne sont pas fournis.Teile ohne **Parts No.** werden nicht geliefert.

Ref. No.	Add- ress	New Parts	Parts No.	Description		Desti- nation	Re- marks
<b>AUDIO UNIT (X09-4462-71)</b>							
D560			B30-2467-05	LED			
C1 -10			CC73FSL1H221J	CHIP C	220PF	J	
C21 ,22			CK73FB1H103K	CHIP C	0.010UF	K	
C23			CC73FSL1H471J	CHIP C	470PF	J	
C31 ,32			CE04KW1H010M	ELECTRO	1.0UF	50WV	
C33 ,34			CC73FSL1H221J	CHIP C	220PF	J	
C35 ,36			CC73FSL1H101J	CHIP C	100PF	J	
C37 ,38			CE04KW1C100M	ELECTRO	10UF	16WV	
C39 ,40			CK73FB1H103K	CHIP C	0.010UF	K	
C41 ,42			CE04KW1R2M	ELECTRO	2.2UF	50WV	
C43			CE04KW1C470M	ELECTRO	47UF	16WV	
C44			C90-3650-05	ELECTRO	100UF	16WV	
C45			CC73FSL1H102J	CHIP C	1000PF	J	
C46 ,47			CC73FB1H221J	CHIP C	220PF	J	
C50 ,53			CK73FB1E104K	CHIP C	0.10UF	K	
C54 ,55			CK73FB1H562K	CHIP C	5600PF	K	
C56			CE04KW1H2R2M	ELECTRO	2.2UF	50WV	
C57 ,58			CE04KW1C100M	ELECTRO	10UF	16WV	
C59 ,60			CC73FSL1H101J	CHIP C	100PF	J	
C61 ,62			CC73FSL1H221J	CHIP C	220PF	J	
C70		*	C90-3683-05	ELECTRO	4.7UF	50WV	
C71 ,72			C90-3622-05	ELECTRO	3300UF	35WV	
C74 ,75			CK73FB1H103K	CHIP C	0.010UF	K	
C76			CK73FB1H223K	CHIP C	0.022UF	K	
C77			CE04KW1E222M	ELECTRO	2200UF	25WV	
C78			CE04DW1V221M	ELECTRO	220UF	35WV	
C79			CK73FB1E104K	CHIP C	0.10UF	K	
C80 ,81			C90-3649-05	ELECTRO	47UF	16WV	
C82			CC73FSL1H102J	CHIP C	1000PF	J	
C83			C90-3658-05	ELECTRO	10UF	16WV	
C85			C90-3649-05	ELECTRO	47UF	16WV	
C87			CK73FB1E104K	CHIP C	0.10UF	K	
C101			C90-3715-05	ELECTRO	4.7UF	35WV	
C102			C90-3644-05	ELECTRO	220UF	10WV	
C103			C90-3680-05	ELECTRO	1UF	50WV	
C104			C90-3715-05	ELECTRO	4.7UF	35WV	
C105			CC73FSL1H471J	CHIP C	470PF	J	
C111-114			CC45FSL1H101J	CERAMIC	100PF	J	
C117,118			CK73FB1H103K	CHIP C	0.010UF	K	
C119,120			CC73FSL1H102J	CHIP C	1000PF	J	
C121,122			CK73FB1E104K	CHIP C	0.10UF	K	
C131,132			CK45FF1H472Z	CERAMIC	4700PF	Z	
C133			CC45FSL1H102J	CERAMIC	1000PF	J	
C141			CK73FB1H103K	CHIP C	0.010UF	K	
C161			C90-3651-05	ELECTRO	220UF	16WV	
C162			C90-3649-05	ELECTRO	47UF	16WV	
C163			CK73FB1H223K	CHIP C	0.022UF	K	
C201,202			CE04KW1C220M	ELECTRO	22UF	16WV	
C203,204			CC73FSL1H221J	CHIP C	220PF	J	
C205,206			CC73FSL1H101J	CHIP C	100PF	J	
C207,208			CE04KW1A101M	ELECTRO	100UF	10WV	
C209,210			CC45FSL1H090D	CERAMIC	9.0PF	D	

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Ref. No.	Add- ress	New Parts	Parts No.	Description		Desti- nation	Re- marks
C211-214			CC73FSL1H101J	CHIP C	100PF	J	
C261,262			C90-3671-05	ELECTRO	47UF	35WV	
C271,272			CC73FSL1H101J	CHIP C	100PF	J	
C273-276			CC73FSL1H471J	CHIP C	470PF	J	
C277,278		*	CC73ECH1H271J	CHIP C	270PF	J	
C279			CQ93FMG1H102J	MYLAR	1000PF	J	
C301			C90-3672-05	ELECTRO	100UF	35WV	
C302			C90-3687-05	ELECTRO	47UF	50WV	
C303			C90-3716-05	ELECTRO	22UF	35WV	
C305			C90-3662-05	ELECTRO	100UF	25WV	
C306			C90-3658-05	ELECTRO	10UF	16WV	
C307			C90-3649-05	ELECTRO	47UF	16WV	
C308			C90-3715-05	ELECTRO	4.7UF	35WV	
C321,322			CK73FB1H103K	CHIP C	0.010UF	K	
C502			C90-3211-05	ELECTRO	33UF	6.3WV	
C503-505			CK73FB1H103K	CHIP C	0.010UF	K	
C506			C90-3253-05	ELECTRO	1.0UF	50WV	
C507			CK73EF1C105Z	CHIP C	1.0UF	Z	
C508			CK73FB1H103K	CHIP C	0.010UF	K	
C509			C90-3216-05	ELECTRO	330UF	6.3WV	
C513-515			CK73FB1H103K	CHIP C	0.010UF	K	
C516			C91-0769-05	CERAMIC	0.010UF	K	
C517			CC73FC1H180J	CHIP C	18PF	J	
C518			CC73FC1H220J	CHIP C	22PF	J	
C524			CK73EB1H103K	CHIP C	0.010UF	K	
C528,529			CC73FSL1H221J	CHIP C	220PF	J	
C531,532			CK73FB1H103K	CHIP C	0.010UF	K	
C533,534			CK73FB1H472K	CHIP C	4700PF	K	
C535			CK73FB1H223K	CHIP C	0.022UF	K	
C701			CK45FF1H103Z	CERAMIC	0.010UF	Z	
C702		*	C90-3681-05	ELECTRO	2.2UF	50WV	
C703			CC45FSL1H331J	CERAMIC	330PF	J	
C704			CK45FB1H561K	CERAMIC	560PF	K	
C705			CC73FC1H470J	CHIP C	47PF	J	
C706			CC73FC1H220J	CHIP C	22PF	J	
C707,708			CK73FB1H103K	CHIP C	0.010UF	K	
C709			C90-3671-05	ELECTRO	47UF	35WV	
CN1			E40-4906-05	FLAT CABLE CONNECTOR			
CN2			E40-9848-05	PIN ASSY			
CN3			E40-9831-05	SOCKET FOR PIN ASSY			
CN4			E40-4234-05	FLAT CABLE CONNECTOR			
CN5			E40-4809-05	PIN ASSY			
CN6			E40-4810-05	SOCKET FOR PIN ASSY			
CN7			E40-4944-05	FLAT CABLE CONNECTOR			
CN8			E40-4898-05	FLAT CABLE CONNECTOR			
CN9			E40-4245-05	PIN ASSY			
CN10			E40-4936-05	FLAT CABLE CONNECTOR			
CN13			E40-4809-05	PIN ASSY			
CN14			E40-4810-05	SOCKET FOR PIN ASSY			
CN15			E40-4295-05	FLAT CABLE CONNECTOR			
CN21,22			E40-4871-05	PIN ASSY			
J2			E63-0046-15	PHONO JACK			
J3			E63-0047-15	PHONO JACK			
J5			E70-0053-05	LOCK TERMINAL BOARD			

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Ref. No	Address	New Parts	Parts No.	Description	Destination	Remarks
J6			E63-0116-05	PHONO JACK		
J7			E08-0312-05	RECTANGULAR RECEPTACLE		
J501			E11-0300-05	PHONE JACK		
△ F1			F05-4016-05	FUSE (SEMKO) (250V T400MA)		
J10			F10-0954-04	SHIELDING PLATE		
CN11,12	*	J19-5717-03		HOLDER		
		J13-0075-05		FUSE CLIP		
L701		L40-1091-17		SMALL FIXED INDUCTOR(1UH)		
L702		L40-1001-17		SMALL FIXED INDUCTOR(10UH)		
X501		L78-0267-05		RESONATOR (4.194MHZ)		
X502		L77-2173-05		CRYSTAL RESONATOR(32.768KHZ)		
X701		L77-2002-05		CRYSTAL RESONATOR(4.332MHZ)		
R1 ,2		RK73FB2A221J	CHIP R	220 J 1/10W		
R3 ,4		RK73FB2A224J	CHIP R	220K J 1/10W		
R5 ,6		RK73FB2A221J	CHIP R	220 J 1/10W		
R7 ,8		RK73FB2A224J	CHIP R	220K J 1/10W		
R9 ,10		RK73FB2A102J	CHIP R	1.0K J 1/10W		
R11 ,12		RK73FB2A224J	CHIP R	220K J 1/10W		
R13 ,14		RK73FB2A221J	CHIP R	220 J 1/10W		
R15 ,16		RK73FB2A224J	CHIP R	220K J 1/10W		
R17 ,18		RK73FB2A102J	CHIP R	1.0K J 1/10W		
R19 ,20		RK73FB2A224J	CHIP R	220K J 1/10W		
R21 ,22		RK73FB2A152J	CHIP R	1.5K J 1/10W		
R23 ,24		RK73FB2A471J	CHIP R	470 J 1/10W		
R28		RS14KB3D151J	FL-PROOF RS	150 J 2W		
R29 ,32		RK73FB2A224J	CHIP R	220K J 1/10W		
R35 ,36		RK73FB2A472J	CHIP R	4.7K J 1/10W		
R37 ,38		RK73FB2A822J	CHIP R	8.2K J 1/10W		
R39 ,40		RD14NB2E2R2J	RD	2.2 J 1/4W		
R41 ,42		RK73FB2A562J	CHIP R	5.6K J 1/10W		
R47		RD14NB2E560J	RD	56 J 1/4W		
R50		RS14KB3A151J	FL-PROOF RS	150 J 1W		
R51		RK73FB2A103J	CHIP R	10K J 1/10W		
R53		RK73FB2A333J	CHIP R	33K J 1/10W		
R54		RK73FB2A222J	CHIP R	2.2K J 1/10W		
R55		RK73FB2A333J	CHIP R	33K J 1/10W		
R61		RK73FB2A472J	CHIP R	4.7K J 1/10W		
R62		RK73FB2A473J	CHIP R	47K J 1/10W		
R65		RD14NB2E5R6J	RD	5.6 J 1/4W		
R66		RD14NB2E330J	RD	33 J 1/4W		
R70		RK73FB2A153J	CHIP R	15K J 1/10W		
R71		RS14KB3A222J	FL-PROOF RS	2.2K J 1W		
R72		RK73FB2A272J	CHIP R	2.7K J 1/10W		
R73		RD14BB2C222J	RD	2.2K J 1/4W		
R74		RK73FB2A472J	CHIP R	4.7K J 1/10W		
R75		RK73FB2A473J	CHIP R	47K J 1/10W		
R76		RK73FB2A103J	CHIP R	10K J 1/10W		
R81		RK73FB2A101J	CHIP R	100 J 1/10W		
R101		RK73FB2A682J	CHIP R	6.8K J 1/10W		
R102		RK73FB2A332J	CHIP R	3.3K J 1/10W		
R103		RK73FB2A473J	CHIP R	47K J 1/10W		
R105		RK73FB2A103J	CHIP R	10K J 1/10W		
R106		RK73FB2A622J	CHIP R	6.2K J 1/10W		
R111-114		RS14KB3DR22J	FL-PROOF RS	0.22 J 2W		

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R121			RK73FB2A473J	CHIP R	47K J 1/10W	
R122			RD14NB2E681J	RD	680 J 1/4W	
R123,124			RK73FB2A272J	CHIP R	2.7K J 1/10W	
R125,126			RK73FB2A133J	CHIP R	13K J 1/10W	
R127,128			RK73FB2A912J	CHIP R	9.1K J 1/10W	
R129-132			RD14NB2E220J	RD	22 J 1/4W	
R135,136			RK73FB2A272J	CHIP R	2.7K J 1/10W	
R137			RK73FB2A471J	CHIP R	470 J 1/10W	
R139,140			RS14KB3A4R7J	FL-PROOF RS	4.7 J 1W	
R141			RK73FB2A473J	CHIP R	47K J 1/10W	
R143,144			RS14KB3A391J	FL-PROOF RS	390 J 1W	
R146			RK73FB2A473J	CHIP R	10K J 1/10W	
R150			RK73FB2A473J	CHIP R	47K J 1/10W	
R151			RK73FB2A472J	CHIP R	4.7K J 1/10W	
R162			RS14KB3A272J	FL-PROOF RS	2.7K J 1W	
R164			RK73FB2A473J	CHIP R	47K J 1/10W	
R201,202			RK73FB2A473J	CHIP R	47K J 1/10W	
R203,204			RK73FB2A100J	CHIP R	10 J 1/10W	
R205,206			RK73FB2A123J	CHIP R	12K J 1/10W	
R207-210			RK73FB2A332J	CHIP R	3.3K J 1/10W	
△ R213-216			RD14NB2E221J	RD	220 J 1/4W	
△ R221,222			RD14NB2E181J	RD	180 J 1/4W	
R231,232			RK73FB2A222J	CHIP R	2.2K J 1/10W	
R241,242			RK73FB2A1R0J	CHIP R	1 J 1/10W	
R243,244			RK73FB2A511J	CHIP R	510 J 1/10W	
△ R261,262			RD14NB2E270J	RD	27 J 1/4W	
R263,264			RK73FB2A473J	CHIP R	47K J 1/10W	
△ R302			RD14NB2E560J	RD	56 J 1/4W	
△ R305			RD14NB2E4R7J	RD	4.7 J 1/4W	
R501			RK73EB2B101J	CHIP R	100 J 1/8W	
R508			RK73EB2B101J	CHIP R	100 J 1/8W	
R509-511			RK73FB2A101J	CHIP R	100 J 1/10W	
R518			RK73FB2A101J	CHIP R	100 J 1/10W	
R520			RK73FB2A101J	CHIP R	100 J 1/10W	
R528			RD14NB2E100J	RD	10 J 1/4W	
R529,530			RK73FB2A103J	CHIP R	10K J 1/10W	
R533			RK73FB2A102J	CHIP R	1.0K J 1/10W	
R534			RK73FB2A103J	CHIP R	10K J 1/10W	
R536			RK73FB2A104J	CHIP R	100K J 1/10W	
R537			RK73FB2A102J	CHIP R	1.0K J 1/10W	
R538			RK73EB2B103J	CHIP R	10K J 1/8W	
R539			RK73EB2B102J	CHIP R	1.0K J 1/8W	
R540,541			RK73FB2A331J	CHIP R	330 J 1/10W	
R542-545			RK73FB2A104J	CHIP R	100K J 1/10W	
R551,552			RK73FB2A102J	CHIP R	1.0K J 1/10W	
R557			RK73EB2B103J	CHIP R	10K J 1/8W	
R561			RK73FB2A104J	CHIP R	100K J 1/10W	
R564			RK73FB2A474J	CHIP R	470K J 1/10W	
R569			RK73FB2A103J	CHIP R	10K J 1/10W	
R570			RK73FB2A102J	CHIP R	1.0K J 1/10W	
R573-575			RK73FB2A102J	CHIP R	1.0K J 1/10W	
R576,577			RK73EB2B103J	CHIP R	10K J 1/8W	
R578			RK73FB2A103J	CHIP R	10K J 1/10W	
R580,581			RK73FB2A104J	CHIP R	100K J 1/10W	
R582,583			RK73FB2A103J	CHIP R	10K J 1/10W	

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## PARTS LIST

# R-SAY

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⑤

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R584			RK73FB2A104J	CHIP R	100K	J	1/10W
R585			RK73FB2A103J	CHIP R	10K	J	1/10W
R586,587			RK73FB2A222J	CHIP R	2.2K	J	1/10W
R589			RK73FB2A473J	CHIP R	47K	J	1/10W
R590			RK73FB2A103J	CHIP R	10K	J	1/10W
R591			RK73FB2A104J	CHIP R	100K	J	1/10W
R592,593			RK73FB2A103J	CHIP R	10K	J	1/10W
R600			RK73EB2B181J	CHIP R	180	J	1/8W
R704			RK73FB2A222J	CHIP R	2.2K	J	1/10W
R707,708			RK73FB2A473J	CHIP R	47K	J	1/10W
VR1,2			R12-1616-05	TRIMMING POT.(1K)			
W201-208			R92-0679-05	CHIP R	0 OHM		
W214			R92-0679-05	CHIP R	0 OHM		
W251-271			R92-0679-05	CHIP R	0 OHM		
△ K1,2		*	S76-0080-05	MAGNETIC RELAY			
K3			S76-0059-05	MAGNETIC RELAY			
S501-509			S70-0031-05	TACT SWITCH			
PH1,2			T95-0149-05	OPTO ISOLATOR			
S516			T99-0559-05	ROTARY ENCODER			
△ D1			D3SBA20F03	DIODE			
D1			RBV-402LFA	DIODE			
D3 -6			S5688B	DIODE			
D3 -6			1SR139-100	DIODE			
D7			HSS104	DIODE			
D8			1SS133	DIODE			
D9 ,10			MA111	DIODE			
D9 ,10			HSS104	DIODE			
D11 ,12			1SS133	DIODE			
D11 ,12			MA111	DIODE			
D21			MTZJ10(B)	ZENER DIODE			
D21			UZ-10BSB	ZENER DIODE			
D23			MTZJ3.9(B)	ZENER DIODE			
D23			UZ-3.9BSB	ZENER DIODE			
D31			MTZJ13(B)	ZENER DIODE			
D31			UZ-13BSB	ZENER DIODE			
D41			HSS104	ZENER DIODE			
D41			1SS133	ZENER DIODE			
D42			MTZJ5.1(B)	ZENER DIODE			
D42			UZ-5.1BSB	ZENER DIODE			
D53			HSS104	DIODE			
D53			1SS133	DIODE			
D71			MTZJ13(B)	ZENER DIODE			
D71			UZ-13BSB	ZENER DIODE			
D72			MTZJ3.9(B)	ZENER DIODE			
D72			UZ-3.9BSB	ZENER DIODE			
D201,202			HSS104	DIODE			
D201,202			1SS133	DIODE			
D301,302			S5688B	DIODE			
D301,302			1SR139-100	DIODE			
D303,304			MTZJ16(B)	ZENER DIODE			
D303,304			UZ-16BSB	ZENER DIODE			
D305,306			S5688B	DIODE			
D305,306			1SR139-100	DIODE			
D307,308			HSS104A	DIODE			

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△ D307,308			1SS131	DIODE			
D309			MTZJ6.2(B)	ZENER DIODE			
D309			UZ-6.2BSB	ZENER DIODE			
△ D310			S5688B	DIODE			
△ D310			1SR139-100	DIODE			
D311			MTZJ6.8(B)	ZENER DIODE			
D311			UZ-6.8BSB	ZENER DIODE			
D502			MA111	DIODE			
D503			HSS104	DIODE			
D503			1SS133	DIODE			
D504-511			MA111	DIODE			
D512			HSS104	DIODE			
D512			1SS133	DIODE			
D515-518			MA111	DIODE			
D521			MA111	DIODE			
D701			HSS104	DIODE			
D701			1SS133	DIODE			
ED1		*	FIP10CM6R	INDICATOR TUBE			
IC1			TDA7345D	ANALOGUE IC			
IC2			NJM4565M	IC(OP AMP X2)			
IC5			TA7812S	IC(VOLTAGE REGULATOR/ +12V)			
IC7			NJU7313AM	ANALOGUE IC			
IC11		*	UPD78044AGF198	MI-COM IC			
IC12			S-806D-Z	ANALOGUE IC			
IC13			X24C04S	MEMORY IC			
IC701			SAA6579	ANALOGUE IC			
Q1			2SD2012	TRANSISTOR			
Q1			2SD2061(E,F)	TRANSISTOR			
Q2			2SA1576(R,S)	TRANSISTOR			
Q4			2SA1534A(R,S)	TRANSISTOR			
Q5 ,6		*	2SC4081(R,S)	TRANSISTOR			
Q7			2SA1175(F,E)	TRANSISTOR			
Q7			2SA933S(Q,R)	TRANSISTOR			
Q11 ,12		*	DTC124EUA	DIGITAL TRANSISTOR			
Q11 ,12			UN5212	DIGITAL TRANSISTOR			
Q13			2SC4081(R,S)	TRANSISTOR			
Q15			2SA992(F,E)	TRANSISTOR			
Q16 -18			2SC4081(R,S)	TRANSISTOR			
Q25			2SC4081(R,S)	TRANSISTOR			
Q29 ,30			2SC1845(F,E)	TRANSISTOR			
Q40 ,41			2SA1576(R,S)	TRANSISTOR			
Q201-204			2SC1845(F,E)	TRANSISTOR			
Q205-208			2SA992(F,E)	TRANSISTOR			
Q209,210			2SC1845(F,E)	TRANSISTOR			
Q211,212			2SC4213(B)	TRANSISTOR			
Q301			2SB764(E,F)	TRANSISTOR			
Q302			2SD863(E,F)	TRANSISTOR			
Q504			2SC4081(R,S)	TRANSISTOR			
A1			W02-2561-05	ELECTRIC CIRCUIT MODULE			

L : Scandinavia  
 Y : PX(Far East, Hawaii)  
 Y : AAFES(Europe)

K : USA  
 T : Europe  
 X : Australia

P : Canada  
 E : Europe  
 M : Other Areas

R : Mexico

G : Germany

△ indicates safety critical components.

## SPECIFICATIONS

## [Amplifier section]

Rated power output

Class AB operation

18 watts per channel minimum RMS, both channels driven, at 6Ω, 1kHz with no more than 10% total harmonic distortion.

(DIN) 1 kHz at 6 Ω, 0.7% T.H.D. .... 12W+12W

Class A operation

5 watts per channel minimum RMS, both channels driven, at 6Ω, 1 kHz with no more than 10% total harmonic distortion.

Total harmonic distortion ..... 0.02%(1kHz, 10W, 6Ω)

Frequency response ..... 20Hz~100kHz, +0dB, -3dB

input sensitivity/impedance ..... 200mV/47KΩ

Output level/impedance

SUPER WOOFER PRE OUT ..... 2.0V/1kΩ

TAPE REC ..... 200mV/1kΩ

Signal to noise ration ..... 92dB (IHF'66)

## [ FM Tuner section ]

Tuning frequency range ..... 87.5MHz~108MHz

Usable sensitivity (DIN)

MONO ..... 1.2μV (75Ω)/13.2dBf(40kHz DEV., S/N26dB)

Signal to noise ratio

(DIN weighted ar 1 kHz, 65.2 dBf input)

MONO ..... 65dB

STEREO ..... 60dB

Selectivity (DIN ±300kHz) ..... 64dB

Stereo separation (DIN at 1kHz) ..... 40dB

## [AM Tuner section]

Tuning frequency range ..... 531kHz~1,602kHz

Usable sensitivity (30%mod., S/N 20 dB) ..... 15μV(500μV/m)

Signal to noise ratio(at 30%mod., 1mV input) ..... 48 dB

Output level/impedance(30%mod., 1mV input) ..... 0.18V/1kΩ

## General

Power consumption ..... 45W

Dimensions ..... W : 200mm

H : 75mm

D : 264mm

Weight (net) ..... 3.3kg



1. KENWOOD follows a policy of continuous advancements in development. For this reason specifications may be changed without notice.
2. Sufficient performance may not be possible at very low temperatures(0°C or less).